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Motivations and Possible Actions of Potential Criminal Adversaries of U.S. Nuclear Programs

Gail Bass, Brian Jenkins, Konrad Kellen, Joseph Krofcheck, Geraldine Petty, Robert Reinstedt, David Ronfeldt

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PREFACE

The research reported here was sponsored by Sandia Laboratories and represents the second phase of a continuing project on the potential threat to U.S. nuclear programs. An earlier Rand report identified possible resources and operational capabilities of potential adversaries: R-2225-SL, *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs*, by P. DeLeon, B. Jenkins, K. Kellen, and J. Krofcheck, February 1978. The present report focuses on adversary motivations. Future research will examine the relative likelihood of different types of nuclear-related crimes and attempt to determine the relative attractiveness of different types of nuclear targets to various potential adversaries.

SUMMARY

This report explores the motivations that might impel individuals or groups to undertake criminal actions against U.S. nuclear facilities or programs. Understanding *why* certain adversaries might want to attack nuclear targets may help us anticipate *what* they might attempt to do and *how*. The analysis involves examination of the motivations behind nuclear-related crimes that have already occurred and of those behind analogous nonnuclear crimes (such as terrorist raids, arson, psychotic bombings, mass murder) that are in some ways similar to potential, but as yet uncommitted, crimes in the nuclear domain. The following paragraphs summarize the study's principal conclusions.

Nuclear defenders must anticipate a surprisingly wide range of threats from an equally wide array of potential adversaries, who may be animated by ideological, economic, or personal motivations, or some combination of the three. The spectrum of possible actions by these adversaries varies greatly in intensity from the adolescent prank to schemes of mass destruction.

Nuclear programs seem to have all of the adversaries faced by any large industry (e.g., disgruntled employees, environmentalists) as well as those faced by any industry that deals in a highly valuable commodity. Nuclear programs also attract some particular adversaries: opponents of nuclear energy and weapons development; political terrorists who view such programs as symbols of the political and economic system they wish to destroy; and emotionally unstable people obsessed by the almost mystical qualities of nuclear power. The fear invoked by the word "nuclear" in the minds of many people may provide a special attraction to certain categories of adversaries.

The presumed range of potential dangers to nuclear programs is not entirely hypothetical. There have already been many low-level actions—bomb threats against nuclear facilities, low-level sabotage, nuclear hoaxes—that provide examples of most of the categories of perpetrators and motives discussed in this report. Such low-level actions appear to have satisfied the aims of their perpetrators and therefore seem likely to occur again. There is little basis for extrapolating from them to higher-level incidents, however.

Only those adversaries driven by blind fanaticism or psychological abnormalities appear likely to attempt nuclear crimes aimed at producing widespread casualties.

The last several years have witnessed an increase in the number and seriousness of nuclear-related incidents. Although we have not seen acts of sabotage aimed at causing radioactive release, a number of incidents have occurred since 1977 in which adversaries demonstrated greater sophistication or willingness to cause casualties.

Owing to popular conceptions and misconceptions of nuclear energy, an incident of relatively harmless actual consequence conceivably could produce large-scale effects. A well-formulated hoax threat, for example, might conceivably cause panic.

Political terrorists constitute one major category of ideologically motivated

adversaries. We foresee the possibility of two types of terrorist actions. First, and more likely, are actions (such as sabotage of nuclear facilities) intended to appeal to opponents of civilian or military nuclear programs, whom the terrorists may regard as a potential constituency. Second, we are liable to see coercive actions in the nuclear domain intended to cause widespread alarm and increase the leverage of a terrorist group making demands on government (perhaps by theft of a nuclear weapon or special nuclear material for threatened use in an explosive or dispersal device).

As to the much-discussed possibility that terrorists might actually employ a nuclear capability to wreak massive destruction, there is a consensus among those who study terrorism that the apparent moral and political constraints that limit large-scale, indiscriminate acts of terrorism still apply. However, there is an accompanying consensus that the conventional terrorist tactics used thus far—bombings, assassinations, kidnappings, hijackings—may be losing their effectiveness. Like the losing side in a war, terrorists might feel an irresistible urge to escalate all the way up to the "nuclear option." However, such action would represent a quantum leap in the application of violence even by those we call terrorists.

Nuclear terrorism would be more likely among the most fanatical and violent terrorist groups, those with more millennial aims as opposed to a concrete political program. To date, domestic terrorist groups that have operated in the United States in recent years have not exhibited the millennialist tendencies that would suggest a willingness to consider an act of nuclear destruction as a serious option. However, we cannot exclude the possibility that some terrorist group active in another part of the world might attempt such an act in the United States.

Antinuclear extremists might attempt to interfere with nuclear facility operations directly through sabotage or violent attack. Alternatively, they might attempt to demonstrate the alleged vulnerability of the nuclear industry's security and safeguard systems. For example, antinuclear extremists might attempt to penetrate and take over a reactor control room solely to demonstrate that such things could be done by more malevolent adversaries. In either type of action, we would expect most antinuclear extremists to attempt to avoid human casualties.

Despite the nonviolent history of antinuclear demonstrations in the United States, the possibility remains that radical groups or unstable people might join future demonstrations and attempt to foment violence. A secondary effect of a violent demonstration, perhaps more significant than the chances of immediate damage to a facility, is that confrontation with police, injuries, and arrests could have a radicalizing influence on some demonstrators or their sympathizers, making them more likely to engage in future criminal actions.

Continued escalation in the public controversy surrounding nuclear energy—as a result of mostly negative news coverage, fictional treatments of nuclear-related issues, and such incidents as the accident at Three Mile Island—may intensify the zeal of some antinuclear activists to the point that they would be willing to commit criminal antinuclear acts to prevent what they perceive as greater future dangers to society, especially if they considered legal means of fighting nuclear programs to be failing.

Widespread popular confusion and ignorance about the utility and safety of nuclear programs must be regarded as an additional vulnerability. More than a few people, bewildered by the complexities of nuclear physics and technology—or,

worse yet, by experts' diametrically conflicting views—may despair of being able to reach rational conclusions regarding nuclear issues and decide to cut the Gordian knot by favoring radical and aggressive negative action.

Nuclear theft appears to hold some potential attractions for professional criminals: the possibility of a very large monetary payoff (through sale, ransom back to the owners, or extortion); the psychological allure of excitement and challenge and the underworld reputation to be gained from such a coup; and the opportunity to wield power, at least temporarily, over society and government authorities. However, strong countervailing deterrents to nuclear crime would also seem to be at work. It is unknown territory. Most criminals are not likely to have ways of contacting potential buyers for stolen nuclear commodities. They may fear exposure to radiation. The theft of dangerous nuclear material could set off a massive government manhunt, and the thieves might not be able to count on protection from the criminal underworld. In spite of it all, we cannot rule out the possibility that some few criminal minds would deem the payoff worth the risks.

To date, there is no evidence of a black market in nuclear material. It seems likely, therefore, that criminals would attempt to steal nuclear material only if commissioned by a buyer in advance (for example, the agent of a foreign government) or with the intent of ransoming the material back to its original owner. New circumstances could change that picture, of course. The spread of nuclear energy programs, increased worldwide traffic in fissionable materials, and proliferation of nuclear weapons could create a market for stolen nuclear material and cause professional criminals to reconsider their reluctance to deal in it.

Psychotics are another source of threat to nuclear programs. Virtually no type of action can be eliminated from the potential repertoire of acts contemplated by the functioning psychotic, that is, one who despite severe psychological disturbance nonetheless may be capable of planning a complex series of actions. Moreover, if operating within a delusional system, the psychotic adversary may feel completely justified in his actions.

Employees represent a special potential threat to nuclear programs because of their physical access to nuclear facilities and their special information and knowledge, which could enable them to exploit vulnerabilities in the system. Employees might be prompted to undertake hostile actions out of personal job frustrations; ideological disillusionment; economic self-interest; labor-related strife; a psychotic episode; or a variety of idiosyncratic reasons. Moreover, there is the danger of coercion of a loyal employee by outsiders, through threats of physical harm or blackmail, to cooperate in criminal acts against a nuclear facility.

The more effective the security systems of nuclear facilities are rendered against outside penetration, the greater would be the need of outside adversaries to recruit insiders to cooperate in their criminal schemes. Thus, the insiders issue would assume increasing importance for security considerations, and also for future research and analysis.

Professional criminals are unlikely to secure the more sensitive jobs in nuclear facilities, because most of them have criminal records that would be picked up during routine background investigations of applicants for such positions. The criminal with no record conceivably could slip through. And the amateur criminal or opportunist—the employee who will seize the chance to cash in on a fortuitous opportunity—probably cannot be identified in advance.

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Chapter 1
INTRODUCTION

This report analyzes the motivations and intentions of potential criminal adversaries of U.S. nuclear programs and facilities, from which it is possible to draw plausible inferences about actions and targets they are likely to prefer. Such inferences, when linked to information about the material and operational capabilities of various types of adversaries, and about their past activities, can help officials responsible for nuclear security to design and implement more effective systems for deterring and defending against nuclear crimes.

We use the term "nuclear programs and facilities" in its broadest sense, to include weapon fabrication facilities, civilian nuclear energy facilities and facilities in the fuel cycle, nuclear research facilities, facilities that fabricate fuel for naval reactors, and all related transport of nuclear material.[1] The term "nuclear crime" refers to a malevolent criminal action against a nuclear target or involving nuclear material or weapons. We exclude from this category legitimate acts of protest and even minor delinquencies such as trespassing when these are not part of some more serious action. We are most concerned with crimes that may cause significant damage or disruption, and especially with those crimes that may directly or indirectly imperil public safety. We include among these attack, seizure, or sabotage of a nuclear facility; threats against nuclear facility personnel or their kidnapping or assassination; theft or diversion of nuclear material; release of radioactive materials; theft or detonation of a nuclear weapon; construction of an improvised nuclear device; and extortion involving nuclear materials or weapons.

METHODOLOGY

An earlier Rand report, *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs*, R-2225-SL, February 1978, described the material and operational capabilities likely to be displayed by various categories of potential nuclear adversaries. Because there have been few attacks to date against U.S. or foreign nuclear programs, the earlier study relied primarily upon an "analog methodology," drawing inferences about potential nuclear adversaries from analysis of a data base of actual crimes that have certain features likely to be found in nuclear crimes (e.g., task force crimes, terrorist assaults, industrial sabotage, symbolic bombing).

The methodology of the present study is complementary to that of the earlier study. But here we are more concerned with the *why* of behavior (motivations) rather than the *what* (weapons, tactics, techniques); hence the report offers less

[1]In the United States, responsibility for security of such facilities is divided between the Nuclear Regulatory Commission, which establishes security standards for licensed nuclear facilities (nuclear power reactors and fuel cycle facilities), and the Department of Energy, which is responsible for the security of government nuclear research facilities and nuclear weapons fabrication programs.

empirical evidence and the analytic process is necessarily more speculative. The contents of this report reflect the insights gained from four interrelated lines of inquiry: a structural approach, a psychological approach, an analog approach, and an examination of past nuclear incidents.

In the structural approach, we posit the most likely combinations of perpetrators, motivations, and intentions, and then identify actions that would be congruous to them. For example, a disgruntled employee (whose motivation we would label "personal") might want to inflict economic damage upon his employer, perhaps by temporarily disabling a plant, disrupting operations, or damaging equipment through such actions as vandalism, sabotage, and hoax bomb threats. Such actions would have less appeal to the group with economic motives, who would be more likely to turn to theft of material or to extortion schemes involving threats to personnel or facilities.

The structural approach does not attempt to penetrate deeply into the mind of the perpetrator and, in a sense, contains an element of tautology. Thieves steal. Terrorists terrorize. Nonetheless, it is useful as a means of identifying likely combinations of perpetrators and actions, and ultimately, of capabilities and targets.

In the psychological approach, we attempt to penetrate the mind-set of the adversary more deeply than we do in the structural approach, although we do not delve into unconscious motivations. By examining the communiques and manifestos of terrorist groups, the biographies and autobiographies of terrorists, and the various theories of terrorist behavior, we have gained some insights into the conscious motivations and intentions of terrorist groups as they pertain to the nuclear domain. Similarly, the literature on the criminal mind and criminal behavior yields some clues to the motivations of the potential nuclear adversary.

The third line of inquiry, the analog methodology used in our earlier study of adversary resources, capabilities, and methods, is extended here to examine the motivations and intentions of possible adversaries. In the following chapters we explore the motivations of various categories of criminals whose actions have been in some ways analogous to possible nuclear crimes. They include sophisticated burglars, arsonists, mass murderers, and psychotic bombers. The assumption is that those who might be prompted to undertake the analogous nuclear crime (e.g., theft of special nuclear material (SNM), or mass contamination by radioactivity) would reflect similar motivational patterns.

Lastly, although serious criminal actions involving nuclear facilities or material have been few, there have been a large number of incidents of vandalism, minor sabotage, theft, and symbolic acts of violence at nuclear facilities. Numerous threats to bomb nuclear facilities or to use nuclear devices have been made. These incidents cover a spectrum of motivations, including economic, political, antinuclear, or environmental concerns, and psychosis. Such incidents free us from relying entirely on posited motives or on analogs. Our fourth line of inquiry, then, was to examine all such nuclear incidents for motivation, and compare our conclusions with those produced by the other lines of inquiry. (The matrix in Chap. 10 identifies the most likely combinations of adversaries and actions, and indicates which types of actions have already occurred.)

Our conclusions reflect a synthesis of findings from all four lines of inquiry.

A note of caution is in order. For much of our analysis, we examined criminal actions in our data base to infer the motivations that might have stimulated them.

Because motivations are not directly observable, these inferential leaps are inherently somewhat problematic. Further uncertainty arises when we extend our inferences to the realm of nuclear adversaries, because our data base consists mostly of nonnuclear incidents. Nuclear crimes might be qualitatively distinct from the data in hand. However, our methodological assumption is that the inferential process followed here, judiciously applied, allows us to offer much more plausible conclusions than would be possible if we had to depend exclusively on hypothetical scenarios.

MOTIVATIONS OF POTENTIAL ANTINUCLEAR ADVERSARIES

The motivations that might impel people to undertake criminal actions against U.S. nuclear programs can be roughly divided into three categories: ideological, economic, and personal. Ideological motivations are those linked to a political or philosophical system. They would include those of political terrorists, antinuclear extremists, and certain groups of philosophical or religious fanatics. Such adversaries might fix on nuclear facilities as a target in hopes of influencing government (or industry) policy on nuclear energy or nuclear weapons; as a way of coercing changes in other (nonnuclear) areas of government policy; as a way of undermining public confidence in the government and promoting political unrest; or as part of a plan to impose their idiosyncratic philosophical or religious perspective on society at large. Economic motivations involve a desire for financial gain. Both professional and amateur criminals might envision a dazzling bonanza in seizing nuclear material or weapons for ransom, sale, or extortion. Personal motivations can be as various as the special situations of specific individuals. A hostile employee may commit a nuclear-related crime as vengeance against his employer; a psychotic may do the same in obedience to the command of a celestial voice.[2]

This three-way categorization of motivations is merely an expository convenience, of course. Some adversaries may resist being so neatly pigeonholed because they have multiple motivations. For example, a group of political terrorists might see the theft and ransom of nuclear material as a way to advance both their ideological goals and their finances. Or a disgruntled nuclear industry employee might accept a bribe to furnish a criminal group with information about plant security procedures, thereby gaining both vengeance and money.

The three types of primary motivations we have described—ideological, economic, and personal—generally operate at the conscious level. They correspond to the reasons an adversary could cite for undertaking an action. Subtler and possibly unconscious motivations will also be at work, of course, in both individuals and groups. Hostility to authority, or the thrill of taking risks and engaging in violence, may be a powerful stimulus for some people. Self-aggrandizement may be another, because of the extraordinary publicity likely to attend any daring nuclear crime. At the group level, political terrorists may be prodded to act by the pressures of

[2]We recognize that financial gain can also be considered a "personal" motivation. We have chosen, however, to treat it separately in Chap. 3, and to reserve the term "personal motivation" for the broad collection of idiosyncratic motive forces.

living at close quarters underground, combined with the need to maintain morale and dedication at a high pitch through action, whether against nuclear or other targets. Throughout this report, reference will be made, as appropriate, to such less conscious, subsidiary motivations, but our analysis will concentrate on the salient ideological, economic, and personal motivations.

AGENTS OF FOREIGN GOVERNMENTS AS POTENTIAL ADVERSARIES

This report does not examine in detail the potential for nuclear crimes by agents of foreign governments in the United States. This does not reflect our judgment that such crimes are less likely or less important than those that domestic adversaries might attempt; but the agent's personal motivations have limited relevance for this study because he acts on orders from his government. Consequently, an analysis of foreign agents' motivations would lead us far off the path into the realms of international strategy. For these reasons, we have chosen to defer the subject to future research, and treat it only briefly here.

The threat from foreign agents should not be ignored. History records numerous cases of acquisition of nuclear secrets, alleged diversions of nuclear material to foreign countries, and both planned and actual incidents of sabotage of nonnuclear targets involving foreign agents. This type of adversary may grow in significance in coming years, as the attempt by the United States and other nuclear powers to prevent nuclear proliferation clashes with the desire of other nations to gain access to nuclear weapons technology.

The potential for actions by foreign agents working as employees of the nuclear industry is addressed briefly in Chap. 5, and, for the sake of completeness, the matrix in Chap. 10 includes "in service of foreign government" as a category of adversary. We plan to devote additional attention to the foreign agent issue in future research.

ORGANIZATION OF THE REPORT

Chapters 2, 3, and 4 explore what we consider to be the three major motivational categories that might inspire nuclear-related crime. Chapter 2 deals with ideologically motivated adversaries, such as political terrorists and antinuclear extremists. Chapter 3 examines economically motivated adversaries, those who might engage in nuclear crime for financial gain. Chapter 4 discusses people who may be driven by personal motives, drawing largely on an analysis of psychotic bombers. Chapter 5 analyzes a special category of potential adversaries—employees of nuclear industries—whose motivations could be ideological, economic, or personal.

Chapters 6 and 7, respectively, report our analyses of the motivations behind arson and mass murder, two nonnuclear crimes that serve as analogs for possible actions in the nuclear domain. Chapter 8 gives an overview of the nuclear incidents that have already occurred and examines the apparent motivations behind threat messages involving claimed possession of nuclear material or weapons.

Chapter 9 considers the climate for potential malevolent actions given recent news and fictional coverage of nuclear programs and the accident at Three Mile Island. Chapter 10 presents and discusses a matrix linking specific motivations with the possible actions they might inspire. (The last page of this report is an enlarged copy of the matrix, which the reader may wish to detach for posting or other uses.) Chapter 11 reviews our conclusions and their implications for safeguarding nuclear facilities.

Chapter 2

IDEOLOGICALLY MOTIVATED ADVERSARIES

Ideological motives for nuclear-related crime stem from political or philosophical beliefs. They might include the desire to influence policies related to nuclear energy or nuclear weapons; to bring about changes in other governmental policies; to provoke political and social unrest by undermining public confidence in the government; or to impose a special philosophical or religious perspective on society at large. This chapter deals with two categories of such adversaries: political terrorists and antinuclear extremists.

TERRORIST MOTIVATIONS FOR NUCLEAR ACTIONS

In view of the stepped-up activities of political terrorists around the world in recent years, and with mounting public concern about nuclear security and safety issues generally, it is not surprising that the popular press has been filled with articles on the possibility of terrorists "going nuclear." Novels and films have portrayed nuclear crimes by terrorist groups: takeovers or sabotage of nuclear facilities; theft of nuclear material; and construction of improvised nuclear weapons to be used in extortion plots. If the essence of terrorism is to gain notoriety for a cause and inspire fear in the public, nuclear schemes may well hold some attraction for terrorist groups; but deterrents also stand in the way.

A variety of motivations might cause terrorists to consider nuclear crimes. Given that leftist radicals see nuclear programs as symbols of a corrupt, militarist, capitalist state, they may attempt violent actions against nuclear targets as a way to rally opponents of civilian or military nuclear programs to their cause. European terrorist groups clearly have identified the antinuclear movement as a source of possible supporters and have carried out actions calculated to appeal to the more extreme members of that movement. In Spain and France, Basque and Breton separatist groups have attacked nuclear power plants; in West Germany, members of the Revolutionary Cells have attacked persons charged with maintaining the security of nuclear facilities just after violent confrontations between antinuclear demonstrators and police; it has been reported that in Italy a Red Brigades document urged attacks on nuclear power plants to exploit antinuclear sentiments in the country.

Thus, one type of terrorist action might include threats against or sabotage of civilian nuclear facilities under construction or in operation; threats or actions against executives or security officials at nuclear facilities, particularly where there may have been violent confrontations between antinuclear demonstrators and police or security personnel; operations on behalf of persons jailed for antinuclear activities; and armed occupations, thefts, or other actions calculated to demonstrate a danger in nuclear programs or an inadequacy in security and safety

measures and to undermine public confidence in the nuclear industry and the government. These actions would all have in common an intent to make a political statement about nuclear-related issues.

In a second type of action, terrorists might use a nuclear scheme for its coercive power, hoping that the widespread alarm such an action would presumably trigger could increase their leverage in making demands on the government. Nuclear extortion could involve political demands (e.g., specific changes in foreign policy, release of all "political prisoners") or demands for vast amounts of money to finance the terrorists' operations. Coercive actions might involve theft of a nuclear weapon or SNM for threatened use in an explosive or dispersal device, or the fabrication of a credible hoax threat.

Insofar as we know, no terrorist group has attempted to acquire a "nuclear capability," by which we mean *possession* of a nuclear weapon or nuclear material for possible use in a nuclear explosive or dispersal device. (No presumption is made regarding the terrorists' ability to bypass the permissive action links in a military weapon or successfully fabricate a nuclear bomb.) Nor has any known terrorist group claimed possession of nuclear material or of a nuclear device, or threatened to acquire and use one.[1] The lone piece of evidence on this score is an underground interview with a former member of West Germany's terrorist movement, who states that members of the Red Army Faction (Baader-Meinhof Gang) have discussed the possibility of nuclear extortion, and this one ex-member regards it as a definite possibility. However, we simply do not know if any terrorist group has seriously contemplated attempting to gain a nuclear capability, although terrorists seem to be fully aware of the coercive power of a nuclear weapon. In the words of the former gang member, terrorists with a nuclear weapon would be able to make "the Prime Minister dance on a table in front of the TV camera. And a few other statesmen alongside him."[2]

Although terrorists may seek to exploit the fear that could be generated by a nuclear extortion scheme for coercive purposes, a nuclear crime that would kill or harm hundreds or thousands of people could severely backfire on the perpetrators. It might split the ranks of the terrorist organization, alienate its supporters and sympathizers, arouse public revulsion, and provoke severe repression. There is consensus among those who study terrorism that the self-imposed moral and political constraints that have limited large-scale indiscriminate acts of terrorism in the past still apply. This view is confirmed in the few inside views of terrorism we have. One former member of a German terrorist group states that it would be wrong to bring down three Lufthansa planes with bombs, as German terrorists threatened to do in 1977 following the suicide of three of their comrades in prison; this would kill "innocent people." Once the first plane went down, indeed, he would "tell everything."[3]

At the same time, close observers of terrorism are becoming convinced that the conventional terrorist tactics used thus far—bombings, assassinations, kidnappings, hijackings—may be losing their effectiveness. Their coercive power has been

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[1]Several authors of nuclear extortion threat messages (see Chap. 8) have purported to represent groups, but these claims are unsubstantiated.

[2]*Stern*, June 1, 1978, interview with Michael Baumann.

[3]*Der Spiegel*, August 7, 1978, interview with Hans-Joachim Klein.

declining since the mid-1970s, as governments have stiffened their resistance to terrorist demands. The publicity value of these actions is also declining, having become almost commonplace in the last decade. As in war, if neither side prevails, the urge to resort to the "nuclear option" may well intensify. The brutalizing effect of their continued violence, the losses they suffer, their perception that the police and military apparatus of the state have been unleashed against them, their growing cynicism regarding "the people" on whose behalf they claim to fight, or a belief that their cause is all but lost, could erode terrorists' constraints against committing —or threatening—violence on a larger scale.

Judging from the comments of one of the former German terrorists mentioned above, terrorists are aware of the decreasing utility of their existing repertoire of actions and view the nuclear option in this context: "During their attack on the Stockholm Embassy, the Red Army Faction people noticed that the government no longer gives in. Therefore, I do not understand why they still did that thing with Schleyer at all. But they did it and again nothing was accomplished. Now they have to do something that will work for sure, and what else can that be except the ultimate thing?" When asked if that meant they might occupy a nuclear power station, he replied, "Sure. These are intelligent people and they have vast amounts of money. They also can build a primitive nuclear bomb. But an attack on a storage depot is more likely."[4]

Among terrorist groups, some are more likely to display a propensity for indiscriminate violence than others. Terrorist groups with more millennial aims, as opposed to those operating on behalf of concrete political programs, may be less constrained in their actions and hence more willing to cause or risk mass casualties. These more fanatical and extreme terrorist groups tend to hold apocalyptic views, devoid of specific political content, and seek the creation of new and continuing disasters as the precondition for the emergence of a new heavenly order on earth. One example of this orientation is the Japanese Red Army. Despite its nebulous goals, its members have exhibited a willingness to kill and die that exceeds that of other terrorist groups. They demonstrated this when several of their members carried out the Lod Airport massacre of 25 persons (76 others were wounded) in May 1972, and again in 1972 when, because of internal disputes, they tortured and murdered 14 of their own members. Groups such as this might not hesitate to commit nuclear crimes that would endanger many people.

In contrast, there are also more pragmatically oriented terrorist groups, both in the United States and abroad, which focus on specific political issues. The New World Liberation Front, for example, a small terrorist group responsible for numerous bombings in Northern California, concentrates on local issues (e.g., utility rates, low-income housing, jail conditions). Despite its violent methods, the group is concerned with its public image and takes extreme care that its bombs do not cause casualties. An act of nuclear terrorism that jeopardized public safety would clearly violate the self-imposed norms of such a group, but it is conceivable that it might undertake less serious nuclear crimes, such as symbolic bombings or attempts to disrupt facility operations without killing or injuring people.

To date, domestic terrorist groups in the United States have given no evidence of millennialist tendencies that would lead them to consider an act of nuclear

[4]*Stern*, June 1, 1978, interview with Michael Baumann.

destruction as a serious option. However, we cannot confidently rule out the possibility that some terrorist group active in another part of the world might attempt such an action in the United States to exert leverage over U.S. foreign policy, undermine the U.S. government, or punish the United States for past actions (e.g., its role in the Middle East settlement), or might attempt to steal nuclear material from a U.S. facility to be used in a nuclear scheme in another country.

ANTINUCLEAR SENTIMENTS AS A MOTIVATION FOR CRIMES AGAINST NUCLEAR PROGRAMS

This section examines the potential for criminal actions by individuals or groups whose motivations are directly antinuclear. Unlike political terrorists, who might attack nuclear facilities as symbols of the existing political and economic order, antinuclear adversaries are motivated by specific opposition to nuclear programs rather than a general commitment to political terrorism. We recognize that there may be specific individuals or groups who do not fit neatly into one or the other of these categories, but we think that, overall, the two groups differ sufficiently in their motivations and possible actions as to justify distinguishing between them.

In that connection, we emphasize that our concern here is with potential criminal actions spurred by antinuclear sentiments, not with the legitimate activities of opponents to the development and use of nuclear energy. Litigation, lobbying, and ordinary political pressure are not within our purview here. The possibility, discussed below, that fervent antinuclear sentiments might goad scattered individuals into criminal actions should in no way be interpreted as impugning the motives or actions of law-abiding citizens involved in the antinuclear movement.

Antinuclear sentiments in the United States and elsewhere take many forms. Some people object primarily to nuclear weapons, others primarily to nuclear energy programs. Many oppose all forms of nuclear development, alleging environmental hazards, danger of accidents, and difficulties of nuclear waste disposal. Some citizens may not necessarily oppose nuclear energy programs in general, but would object to the placement of a nuclear power plant in their "backyard."

Several past acts of sabotage directed against U.S. nuclear facilities can be attributed to antinuclear motivations. In February 1974, a man toppled a 400-foot meteorological instrument tower at a proposed nuclear power plant site in Massachusetts. He later surrendered to police, and claimed in a written statement that he took action because the proposed plant would be dangerous to the community.

In October 1977, the "Environmental Assault Unit" of the New World Liberation Front (NWLF) claimed credit for bombing the visitors' center at the Trojan nuclear power plant in Rainier, Oregon. The NWLF had previously boasted of numerous bombings of government, business, and public utility facilities in the San Francisco Bay area. It is not known whether the Trojan bombing was in fact ordered by the NWLF leadership, or whether the so-called Environmental Assault Unit represents a splinter group operating independently, or possibly is unconnected with the NWLF but uses the name to attract greater attention to the action and at the same time displace blame.

The past decade has seen a number of other unsolved cases of bombings and discoveries of unexploded bombs or explosives at nuclear facilities. We do not know what motives were behind these incidents.

In Europe, bombings and serious sabotage incidents at nuclear facilities have been more frequent; some of these were apparently committed by antinuclear individuals or groups. In May 1975, for example, two bombs exploded at a nuclear power station under construction in Fessenheim, France. The explosions started a fire that damaged a peripheral area of the nuclear reactor complex. The reactor itself did not yet contain fissionable material. Shortly before the bombs exploded, a caller identified himself as a member of a previously unheard-of group that took its name from two known anarchists (the "Meinhof-Puig Antich Group," after the West German anarchist Ulrike Meinhof and Puig Antich, a Spanish anarchist executed in 1974 by the Franco government for killing a policeman). In the months preceding the bombing, there had been local opposition to the construction of nuclear power stations in the area, and it was reported that antinuclear extremists may have used the cover of political extremism to publicize their cause. Two bombs were detonated at other French nuclear facilities in June 1975. Again, a previously unknown group claimed credit for the incidents. One bomb was placed at Framatome's main computer center in Courbevoir, destroying half of the input terminals; the second bomb was planted at Framatome's workshop in Argenteuil, causing some damage in the valve-testing shops. Again, it was speculated that persons opposed to nuclear power may have been using a political cover to advance their cause.

In early November 1976, a bomb exploded in the Paris offices of a manufacturer of nuclear fuel elements, causing extensive damage but no casualties. Responsibility for the attack was claimed by a man identifying himself as a member of the Commando d'Opposition par Explosifs à l'Autodestruction de l'Univers ("Commando of Opposition by Explosives to the Self-Destruction of the Universe"), forming the French acronym COPEAU. Less than a week after the Paris blast, COPEAU claimed credit for two more bombs detonated at a uranium mine in southwestern France. The bombs destroyed four pump compressors, putting the mine out of operation for about two months and causing an estimated $2 million damage.

The German press recently reported the publication of a "Do-It-Yourself Manual" by radical antinuclear elements. The authors report their "experiences gained in resistance actions" and give "hints for practical resistance to nuclear installations." They recommend that resisters not target reactors themselves, because of radiation danger, but rather concentrate on sabotaging electrical power components, using either explosives or other suggested means. In the past few years, Germany has witnessed numerous attacks on high-tension poles and power plant buildings.[5]

As suggested earlier, groups with other political agendas may attempt to exploit antinuclear sentiments.

In Germany, France, and Spain, political terrorist and separatist groups have attacked nuclear facilities, apparently hoping to attract the broader antinuclear constituencies in these countries to their own causes. For example, in March 1978,

[5]*Frankfurter Allgemeine Zeitung*, August 10, 1979, pp. 1-2.

Basque separatists placed a bomb in the steam generator of a nuclear power plant under construction at Lemoniz, near Bilbao, in Northern Spain. The blast killed two workers, injured fourteen, and caused heavy damage. The reactors had not yet been fueled.

In theory, there appear to be two separate ways in which antinuclear sentiments could spur individuals or groups to take criminal actions against nuclear facilities. First, some opponents of nuclear programs generally or of a specific nuclear facility may be very determined and, in despair of prevailing through legal measures, might resort to bombings, arson, or other violence to cripple a nuclear facility or prevent its construction. Their collateral aim might be to publicize nuclear dangers and sway public opinion.

Assuming that these people are not psychotic, most of them would probably try to avoid injury or loss of life either to plant employees or the public. In the Fessenheim bombing, for example, a telephone warning was received an hour in advance, permitting workers to evacuate the site. In the Lemoniz bombing, a spokesman for the Basque guerrilla organization, Euzkadi Ta Azkatasuna (Basque Homeland and Liberty), telephoned a radio station ten minutes before the explosion, urging that the 1,000 workers at the construction site be evacuated immediately because a bomb had been planted. The utility company constructing the reactors said the warning came too late, however, to prevent the casualties. It is not clear whether the warning, which did indeed come too late, was given too late on purpose or by accident.

It is also conceivable that a determined adversary, despairing of less drastic methods, might take action to cause limited casualties, perhaps through radioactive contamination. The reasoning would presumably be that a few casualties are warranted if they awaken the public to the dangers of larger-scale catastrophes. It seems more likely, however, that such adversaries would try to limit their actions to destruction of property.

The second type of action that might be motivated by antinuclear sentiments would be intended not primarily to interfere with facility operations, but rather to demonstrate the vulnerability of the nuclear industry's security and safeguards systems. For example, an adversary group might try to steal a nuclear weapon, divert nuclear material from a reactor facility, hijack a shipment of nuclear material, construct an improvised nuclear device, or penetrate and take over a reactor control room to prove that such things could be done by adversaries with malevolent objectives. An incident might be designed both for propaganda value—utilizing media coverage to win converts to the antinuclear position—and to extract concessions from the government or industry on upgrading security measures (e.g., a terrorist might say: "We will return the stolen nuclear material if you appoint individuals of our choice to an expert panel to review present safeguards procedures and oversee implementation of new ones"), or the actual cessation of nuclear activities.

In this context, it is appropriate to consider the possibility of violent demonstrations at nuclear facilities. To date, such demonstrations in the United States have not been violent, although numerous people have been arrested for peaceful forms of civil disobedience, primarily trespassing. The nonviolence appears to be the result of both effective planning on the part of the protesters and effective policies by law enforcement officials.

The U.S. antinuclear movement is a loosely knit coalition of pacifist, environmentalist, political and religious groups. The movement is decentralized, with local groups directing their own activities. Protests at nuclear facilities have tended to follow a common model. Demonstrators are organized into affinity groups of ten to twenty people who are trained together (in nonviolent techniques, risks of arrest, and nuclear-related issues) and who stay together during the demonstration. According to press reports, leaders attempt to keep law enforcement officials informed of their plans, discourage the use of drugs and alcohol, and maintain an image of discipline and high moral purpose. For the most part, leaders of the movement are on record as wanting to keep the movement nonviolent, to prevent its being viewed as extremist by the general public.[6] However, recent statements by some antinuclear groups condone the destruction of property, though not violence against people, in the pursuit of their objectives.

European antinuclear protests have been more violent. On a number of occasions radical-leftist groups have apparently infiltrated the ranks of the peaceable antinuclear movement, and large-scale demonstrations have turned into violent confrontations. In March 1977, for example, at Grohnde, West Germany, a protest by 10,000 nuclear power plant opponents erupted into violence when about half the group detached themselves and attacked police and security forces. Many of the attackers wore helmets and shields and were equipped with such devices as slingshots with steel balls, chains, rocks, lances, hatchets, bolt cutters, grappling hooks, and welding torches equipped with auxiliary generators. Aluminum kites and balloons were used to interfere with police helicopters and communications gear. The operation was obviously well planned; it has been reported that German Communist groups had recruited and prepared personnel for the demonstration at training camps equipped with replicas of the plant's security gates. Communist organizers reportedly supervised the attack from a bus near the scene, giving orders over loudspeakers and walkie-talkies. A total of 237 police and 60 civilians were injured during the three-hour battle, in which the attackers were finally routed by water cannons, tear gas, and mace.

Also in 1977, 20,000 demonstrators from France, Germany, Switzerland, and Italy battled 5,000 French riot police at Creys-Malville, the site of the world's first commercial fast breeder reactor.[7] One demonstrator was killed and over a hundred were injured. Accounts of the confrontation vary, with some blaming a group of about a hundred radicals, thought to be West Germans, for deliberately sparking the violence and others charging the police with provocation and overreaction.

Although there have been arrests for trespassing during demonstrations at U.S. nuclear facility sites such as Seabrook, New Hampshire, and Rocky Flats, Colorado, there has been no violence. The possibility cannot be ruled out, however, that radical groups or unstable people attracted to such a mass movement might attempt to foment violence at a demonstration, despite the efforts of the movements' leaders. It is conceivable, for example, that a sophisticated terrorist group would try to incite a massive violent confrontation with police and security guards

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[6]*Christian Science Monitor*, March 24, 1978; *Newsweek*, June 5, 1978.

[7]Nigel Hawkes, "The Antinuclear Movement Takes Hold," *Science*, Vol. 197, September 16, 1977, pp. 1167-1169; William Sweet, "The Opposition to Nuclear Power in Europe," *The Bulletin of the Atomic Scientists*, Vol. 33, No. 10, December 1977, pp. 40-77; Anna Gregory; "France Kills its First Protester," *The Nation*, October 8, 1977, pp. 330-333.

during a demonstration, in order to penetrate and sabotage the facility during the ensuing chaos and confusion. That was done in 1978 during riots at Japan's new Narita airport, when a team of hammer-wielding leftist terrorists stormed the control tower, causing $13 million in damages, while police were attempting to contain the demonstrators.

The possibility of violence at antinuclear protests suggests another potential problem: Confrontations with police, injuries, and arrests could have a radicalizing influence on some demonstrators, making them more likely to join in criminal actions in the future.

The recent accident at Three Mile Island has focused national attention on issues of nuclear safety. As evidenced by the approximately 65,000 demonstrators who participated in an antinuclear march in Washington, D.C., and the large numbers joining in protests in other parts of the country, this incident apparently added impetus to the antinuclear movement. It cannot yet be determined whether Three Mile Island will also stimulate criminal antinuclear actions.

Finally, the visibility of the antinuclear movement may lead adversaries with other motivations—political, economic, or personal—to attempt to make their own criminal actions appear to be the work of antinuclear activists. Several past incidents seem to fit this pattern. After the $10 million fire at the Indian Point, New York, nuclear generating plant in 1971, a letter to the press claimed that "Indian Point guerrillas" were responsible for the blaze and suggested they had been motivated by concern for the environment. The actual arsonist turned out to be an employee of the company. In France, responsibility for the recent sabotage of reactor components bound for Iraq was claimed by the "Group of French Ecologists," proclaiming that "we have turned to action and we will do what is necessary to safeguard the French people and the human race from nuclear horrors." Some press reports, however, have suggested that French environmentalists lack the technical sophistication to carry out such an operation, and that the sabotage was more likely committed by Israeli agents opposed to Iraq's gaining a nuclear capability. Others have suggested that French authorities themselves, experiencing second thoughts about the sale of weapons-grade uranium to Iraq, may have contributed in some way to the sabotage.[8] The truth is still unknown, and may never be unraveled.

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[8]*The New York Times,* April 11, 1979; *Time,* May 7, 1979, p. 40; *Frankfurter Allgemeine Zeitung,* April 17, 1979, p. 3; *Le Nouvel Observateur* April 16, 1979, pp. 42-45.

Chapter 3

ECONOMICALLY MOTIVATED ADVERSARIES

The second major category of motivations for nuclear-related crimes is economic gain. Criminals might envision several ways to profit from nuclear crime. One way would be to steal nuclear material and weapons and hold them for ransom or extortion, owing to their high replacement value and their immense capacity for destruction. Criminals might also find third-party customers willing to pay handsomely for the stolen goods. At the same time, some countervailing factors may discourage criminals from going after a nuclear prize. In this chapter, we will examine both the special attractions and deterrents, from the criminal perspective, of seeking fortune through nuclear crime.

The chapter is divided into five sections. The first briefly reviews a series of past nuclear crimes that were apparently motivated by economic considerations. The second section explores criminal motivation based on analysis of large-payoff, nonnuclear crimes, and draws some inferences for potential analogous nuclear thefts. The third suggests the major types of nuclear-related crimes that might be economically inspired. The fourth section reviews factors that might attract or deter criminals from nuclear crime. And the final section examines the potential for involvement in nuclear-related crimes by organized crime.

ECONOMICALLY MOTIVATED NUCLEAR CRIMES

Many nuclear-related, economically motivated crimes have already occurred, and foreshadow other schemes we may see in the future.

Several incidents of theft have occurred abroad. In November 1966, twenty natural uranium fuel elements were stolen from the Bradwell nuclear power station in Great Britain. The theft was carried out by two men (one an employee at the plant), who were later arrested; the fuel elements were recovered. The thieves said that a man in London had offered them "twenty quid" for the elements, but the London connection was never identified.

In April 1974, a uranium-smuggling operation in India was exposed. Complete details of the incident are not available, but it appears from the rather sketchy press accounts that natural uranium was being removed from a plant in Bihar, smuggled to Nepal, and then secretly shipped to Hong Kong, where Chinese or Pakistani agents reportedly took delivery. It is suspected that as much as $2.5 million worth of uranium may have been involved. The operation was uncovered when five persons participating in it were arrested in India and 3.5 kilograms of uranium were recovered.

In the United States, in February 1979, FBI officials arrested two Albuquerque men near El Paso and seized 5,000 pounds of semi-refined uranium ore, or "yellowcake," believed to have been stolen from a New Mexico uranium mill. This seizure

followed a confiscation three months earlier of 2,000 pounds of yellowcake from a self-service storage shed in Albuquerque. In the earlier incident, neither the source of the stolen material nor its intended destination has been revealed.

In the past few years, there have been several reports of attempted illicit international sales of uranium that subsequently appeared to be cases of attempted fraud. In 1977, undercover federal agents negotiated with a man and woman who were offering for sale what was purported to be a large quantity of nuclear material. The man had previously been involved in trafficking in stolen securities between Northern Europe and the United States and was reportedly well connected in United States organized crime circles. The sellers promised delivery of about two tons of nuclear material that they claimed had been stolen over a period of time from a uranium refining plant somewhere in the United States. Their price was an estimated million dollars in cash and no questions asked. During negotiations, the agents demanded a sample of the material, which was found to contain such minerals as might be found on a plant site, but no uranium. Negotiations subsequently collapsed and the couple disappeared. It is not known if their offer was genuine.

In March 1978, the FBI said it was investigating an attempted sale of 239 pounds of black market uranium—supposedly sufficiently enriched for use in weapons—by a European businessman to a U.S. corporation. Later reports indicated that the mineral was a form of depleted uranium that had little commercial value and no potential use in an atomic weapon.

If there were a developing traffic in low-grade uranium, illicit possessors would also need to find a way of processing it. An incident dating from 1971 is worth noting in this regard. The president of Hydro-Jet Services, Inc., in Texas, reported that he had been offered a bribe of $50,000 a month for the use of his company's equipment in processing half a million pounds of stolen yellowcake. An investigation failed to disclose the theft of any yellowcake or any clue to its existence, and no inventory discrepancies were revealed.

Criminals could also benefit from the theft of nuclear material by extorting money from the government or ransoming it to the company from which it was stolen. Several dozen hoax extortions involving monetary demands and claimed possession of nuclear material or devices have occurred in the United States in the last decade (see Chap. 8), and one such extortion threat, in January 1979, was genuine. A man employed by a subcontractor at the General Electric Fuel Processing Plant in Wilmington, North Carolina, stole two five-gallon drums containing some 150 pounds of uranium oxide (a low-grade nuclear material) and demanded $100,000 from the company for their return. He was apprehended by the FBI before the deadline for complying with his demands. In addition to the motive of economic gain, the man seems to have been seeking revenge for having been terminated prematurely from his job at the plant.

What seemed to be a bizarre nuclear-related theft came to light in the fall of 1978, when the FBI arrested two men for conspiring to steal a nuclear submarine. The two men had tried to arrange to sell to the Mafia, for $150 million, the submarine *Trepang,* which they said they would seize from its berth in New London, Connecticut. Government prosecutors subsequently concluded that the men had intended to do no more than abscond with the $300,000 in front money to be put

up by the buyers. The two were imprisoned for wire fraud—using the telephone in a swindle attempt.[1]

ANALOGOUS LARGE-PAYOFF, NONNUCLEAR CRIMES

The small number of economically motivated crimes just described gives us some indication of the possible range of actions in this domain: theft for sale on a black market, theft for ransom back to the owner, extortion based on threatened destructive acts involving stolen nuclear material, and thefts commissioned by the prospective buyer. Because these nuclear cases are few, however, and because we know so little about the criminals, we sought further insights into the possible motivations and techniques of potential nuclear adversaries by consulting the literature on criminal motivation, and by analyzing data on 35 analogous thefts involving more than a million dollars in value.

Several observations emerge from the literature on the psychology of criminals that seem relevant to our subject.[2] First, researchers in the field find that criminals at all levels of crime derive a great deal of excitement from planning, enacting, and reliving their crimes. This in itself appears to be a major motivation for pursuing crime as a career. The successful execution of a crime is often described in the literature as being more rewarding than the monetary gain. The challenge inherent in a potential nuclear theft might therefore hold some special attraction for criminal types.

Secondly, there is widespread agreement that nearly every criminal has an ultimate goal: "The Big Score." As Cloward and Ohlin comment: "Although one may also achieve material success through the routine practice of theft or fraud, the big score remains the symbolic image of quick success."[3] Or, in the words of Einstadter: "It is to be the final event which leads to retirement—the robbery that promises to end robbery. It is the ever alluring pot of gold at the end of the rainbow."[4]

Ironically, career criminals who do make a Big Score evidently do not retire from crime. Nonetheless, almost all of them dream of it while conducting smaller crimes, and seize the opportunity for the Big Score if it presents itself. Consequently, they may find nuclear schemes appealing—as may amateurs with no previous criminal background. People who have special technical training (e.g., in computers) or have opportunities to observe vulnerabilities in the security systems of nuclear facilities (e.g., plant workers or those involved in transporting nuclear material) may succumb to temptation. Judging from both the literature on target selection by criminals and analysis of our 35 major thefts, both professional crimi-

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[1]Lazlo K. Domjan, "'Subnappers' Hatched a Plot that Just Wouldn't Float," *Los Angeles Times*, October 14, 1979, Sec. VIII, pp. 4-6.

[2]The following discussion draws on the following sources: Stanton E. Samenow, M.D., and Samuel Yochelson, M.D., *The Criminal Personality*: Vol. 1, *A Profile for Change*, Jason Aronson, New York, 1975; Richard Cloward and Lloyd Ohlin, *Delinquency and Opportunity*, The Free Press, New York, 1960; Werner J. Einstadter, "The Social Organization of Armed Robbery," *Social Problems*, Vol. 17, No. 1, Summer 1969; Joan Petersilia, *Focusing Attention on Career Criminals—An Idea Whose Time Has Come*, The Rand Corporation, P-6112, May 1978.

[3]Cloward and Ohlin, p. 22.

[4]Einstadter, p. 82.

nals and amateurs, when planning for a Big Score, choose targets whose security, they are convinced, is either minimal or easily overcome.

Researchers also agree that criminals do not restrict themselves to a single type of crime, such as armed robbery. "One of the clearest findings is that most criminals, even at the later stages of their careers, do not specialize but engage in a wide variety of crime types."[5] At the same time, there are criminals with highly specialized skills, such as arson or circumventing electronic security systems, and we might expect such specialists to become involved in nuclear theft schemes that require their particular skills.

A final point emerging from the literature on career criminals concerns the importance of publicity and peer recognition. They often spend considerable time bragging about their capers (when and where they consider it safe to do so) and sometimes lavish money on celebrating to show how successful they were. Some criminals may be dazzled by the prospect of becoming a pioneer in nuclear crime, famous among their fellows.

Our examination of 35 major thefts uncovered a number of patterns that may be present in future economically motivated nuclear crimes. For example, many of them involved insiders, who either participated in the crime directly or were hired by the criminals to help them in some way. In the $5.8 million theft from Lufthansa at the JFK Airport, a ten-year Lufthansa employee was promised $300,000 (more than any other participant) for his role in the robbery. He simply left his post for more than an hour and a half so that Brink's truck guards were unable to get his signature of authorization to transport the cash. The guards finally gave up waiting and decided to come back after the weekend. The cash remained at the airport, where the thieves broke in and got it as they had planned.

It is also apparent from these data that criminals are quick to take advantage of special opportunities and vulnerabilities in planning a Big Score. In one major art theft, a valuable masterpiece was stolen from a temporary storage area where it was being kept while construction was going on in its usual display area. Also, a number of the crimes took place on holidays; criminals apparently realized that there would be fewer employees and guards on these days, and it would take longer for the crime to be discovered.

Thefts from vehicles (some armored) accounted for ten of the major crimes examined. Several took place when the guards had stopped at restaurants. The cars' being armored seemed to offer little difficulty to professional criminals or insiders, justifying the longstanding concern within the nuclear community that the transport of SNM or nuclear weapons represents a particular security risk.

Several of these crimes, especially major art thefts, involved the prearranged sale of the stolen items. In some cases, organized crime was involved and there was evidence that outsiders had directly commissioned the theft or agreed in advance to purchase the stolen goods. It appears likely that such would also be the case where SNM or nuclear weapons were involved, rather than that "free-lance" criminals would steal first and then look for buyers. Because criminals would be unlikely to have their own uses for nuclear material (other than for extortive purposes), they would presumably want advance assurance that they could sell the stolen material for money.

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[5]Petersilia, p. 6.

POTENTIAL ECONOMICALLY MOTIVATED NUCLEAR CRIME

Considering the nuclear incidents to date and the analogous nonnuclear crimes, we can suggest several types of nuclear-related crimes that might be economically motivated. Theft of nuclear material or weapons might lead to profit in a number of ways: The stolen material or weapons might be ransomed back to their owners or the government; they might be put up for bid to nonnuclear nations or subnational terrorist groups aspiring to nuclear capability; or they might be used in an extortion scheme involving threats of radiation release or detonation.

In the case of nuclear theft for sale, it seems unlikely that the career criminal would initiate the theft without having made arrangements in advance for dispensing of the stolen goods. A more likely scenario is that the career criminal would be commissioned to do the job—that is, would know in advance that he could convert his theft to a monetary payoff.

A third party, someone interested in obtaining nuclear materials or a weapon, might not turn to a career criminal to commit a nuclear theft but might instead try to "buy" insiders. This approach seems riskier, however, since career criminals could presumably be recruited with less fear of exposing the commissioning party to the authorities. A third alternative available to the commissioner would be planting an insider in advance—a form of infiltration—thereby setting the stage for a later theft.

It is important to emphasize that although there is some evidence of an incipient black market in nuclear materials, the possibility of economic gain through nuclear theft does not depend on the existence of this "external market." Rather, the potential for ransoming stolen material back to its original owners constitutes, in effect, a lucrative "internal market." Given the high replacement value of nuclear material, the original owners of stolen material might be willing to pay handsomely for its return. Moreover, their desire to avoid embarrassment over lax security measures and to avoid government fines for inventory shortages might provide further incentives for paying off the thieves in exchange for discreet return of the material. Such a scenario seems to have been in the mind of the man who stole the uranium oxide from the General Electric Fuel Processing Plant (see above).

Threatening to reveal to the public and the government that a company had failed to prevent the theft of its nuclear material is one type of extortion thieves could use to extract a large payoff. Alternatively, they could threaten to use the illicitly obtained material (or conceivably a stolen weapon) in a malicious act of destruction, either through radioactive release or nuclear detonation. Such schemes could be attempted to extort fortunes from both industry and government, with immunity from prosecution as an additional possible demand.

Besides thefts for sale or extortion, acts of sabotage and arson at nuclear plants might also be tied to economic motivation. There are examples of murder for hire, arson for hire, and many cases where employees and others have been hired to sabotage facilities. Parties wishing to sabotage nuclear facilities for whatever reason might hire professional arsonists or bribe insiders to commit or assist in the acts. Three Mile Island illustrates the potential vulnerability of nuclear facilities to human error, and therefore—perhaps—to sabotage. Conceivably, there could be

employees who would be willing to commit such an "error" for a large sum of money.

Another economically motivated act might be the selling of information—layouts of facilities, types of alarms, guard routines—that would help criminals to penetrate the facility. Or, if bribed, a facility guard might take action (or inaction) that would allow access to be achieved. (Chapter 4 considers other motivations, besides the opportunity for economic gain, that might lead employees to abet criminal actions against a nuclear facility.)

NUCLEAR CRIME FOR PROFIT: ATTRACTIONS AND DETERRENTS

To summarize some of the major points in this section, a number of factors may attract criminals, professional or amateur, to steal nuclear commodities. There is the potentially large monetary payoff—through sale, ransom, or extortion—possibly the biggest of Big Scores. There is the possibility of bargaining for immunity from prosecution. Such a grandiose theft would also hold the psychological allure of excitement and challenge, along with the likelihood of fame in criminal circles. Given the antisocial orientation of professional criminals, they might derive special pleasure from possession of nuclear materials or weapons—the ultimate symbols of power—knowing that society and particularly government officials were at their mercy.

In short, a successful theft of nuclear materials or devices could entail the entire spectrum of motives that drive criminal activities. Theft in the nuclear arena could therefore become the Mount Everest of crime.

At the same time, a number of countervailing factors should act as deterrents against nuclear crime. Besides the difficulty of penetrating a nuclear facility, the career criminal may fear "things nuclear" as much as any other lay person does. He may fear exposure to radiation (for good reason), and be haunted in the bargain by less realistic fears absorbed from movie thrillers. These fears may make nuclear theft seem too risky.

Another obstacle might be the mutual lack of contact between criminals and illicit buyers of stolen nuclear commodities. For either side to enter negotiations with the other would entail suspicion and risk.

Most criminals are therefore likely to find safety and comfort in sticking to lesser crimes. The liquor store robber has nothing to fear from police roadblocks or FBI manhunts, but not so the nuclear criminal, and the Atomic Energy Act provides for stiff punishment, including death or life imprisonment, for certain crimes in the nuclear domain.

Furthermore, the common fear of things nuclear may make the nuclear criminal more vulnerable to identification by informers—perhaps even in advance of the crime. Ordinarily, the career criminal counts on his friends and acquaintances to support and protect him, but he may find himself abandoned or thrown to the wolves if he commits a nuclear crime that threatens to bring too much "heat" on the criminal world in general.

In nuclear theft, the professional criminal would be operating with more uncertainties than usual, and the more doubts there are, the less likely the career

criminal is to go ahead with a given crime. Most criminals, although they recognize that they might get caught "someday," go into each crime fully expecting not to be caught. Cause and effect are a bit difficult to separate here. If he has planned carefully, understood and dealt with the risks, and eliminated the unknowns, the criminal is correct that the apprehension rate for any given crime is not very high. If he is too uneasy, as he well might be in a nuclear theft, he might decide not to attempt it.

Another unknown applies to nuclear theft. The "ordinary" criminal knows that even if caught for an "ordinary" crime, he has a good chance of getting off for a variety of reasons. He may go scot-free, or plea-bargaining may result in a light sentence even for a major crime. He has no such assurance in a case of nuclear theft. He knows the prosecution would involve federal agencies, and this certainly holds little appeal. There are few precedents to consult about prosecution and punishment. While the average career criminal may vary the types of his crimes through the years, they are usually roughly similar and he has a fairly good knowledge of the penalties. The "transfer of learning" employed in the usual variations is not likely to work in the nuclear area, and this uncertainty might itself be a dissuasive factor.

ORGANIZED CRIME AS A POTENTIAL NUCLEAR ADVERSARY

Finally, organized crime presents a special aspect of the problem of economically motivated crimes. Organized crime is defined here as an organization dedicated to illegal activities; its existence transcends any single act; the organization survives its members. It is more like a business corporation than a gang, and therefore should be distinguished from ad hoc groups of criminals organized to carry out specific crimes. In the United States, organized crime is generally considered to be a nationwide alliance of twenty-odd "families" of criminals, variously referred to as the Mafia, the Mob, Cosa Nostra, or "the syndicate." In addition to the Mafia families, there are lesser non-Mafia criminal syndicates. The Mafia families are linked to each other and to non-Mafia syndicates by understandings, agreements, and treaties, and by mutual deference to a "Commission" made up of the leaders of the most powerful families.

Members of organized crime allegedly control all but a tiny part of illegal gambling in the United States. They are the principal loan sharks. They are the primary importers and wholesalers of narcotics. They have infiltrated some labor unions and enjoy a virtual monopoly on some legitimate enterprises, such as cigarette vending machines and juke boxes. They allegedly own retail firms, restaurants and bars, construction companies, trucking companies, food companies, meat packing companies, laundries, linen-supply houses, garbage collection routes, factories, and gambling establishments. More recently, they have moved into the manufacture and wholesale distribution of pornography. They also reportedly control a large share of prostitution. The annual take from these enterprises is estimated to be around $50 billion, about half of that being net profit.

Similar criminal syndicates in other countries have varying degrees of connection with each other and with organized crime in the United States. There are also

"families" of smugglers who tend to specialize in certain commodities, and illegal international arms traders who conceivably could become involved in the transfer of intact nuclear weapons or SNM. Collectively, all of these organizations could be considered as constituting a vast international network of organized crime. It has no known central directorate, however.

Whether organized crime should be counted among potential nuclear adversaries remains a matter of some debate. It is often contended that only organized crime, with its vast resources and connections, has the organization, capital, manpower, equipment, and international connections necessary to steal, fence, and smuggle special nuclear material, organize and operate an international black market in stolen nuclear material, or acquire the material and fabricate its own weapon. And it is believed that, at least at some point, even a band of independent thieves would have to seek organized crime's approval for a nuclear heist, fence the stolen material to organized crime, or seek the assistance of organized crime in some manner.

While the capability of organized crime to steal nuclear material or fabricate a nuclear device is not at issue, experts disagree about their interest in doing so. Willrich and Taylor suggest that

> ...possession of a few fission explosives or radiological weapons might place a criminal group rather effectively beyond the reach of law enforcement authorities. A criminal organization might use the threat of nuclear violence against an urban population to deter police action directed against its nuclear theft operations. The organization might also use nuclear threats to extort from the government a tacit or explicit relaxation of law enforcement activities directed against a broad range of other lucrative criminal operations.[6]

However, they go on to point out that

> ... criminal groups primarily interested in money are likely to be politically conservative, and ... would not develop a black market commodity such as nuclear material which could have revolutionary political implications. Moreover, a large nuclear theft might prompt a massive governmental crackdown and lead to a widespread public outcry, whereas the continued existence of organized crime on a large scale might depend on the susceptibility of some government officials to corruption and on a degree of public indifference.[7]

Jenkins agrees that

> One should be cautious about overestimating the attractiveness of engaging in nuclear extortion or trafficking in fissionable material to the criminal underworld, especially to organized crime ... organized crime is a conservative, service-oriented industry. It provides gambling, prostitution, and narcotics. The profits from the provision of these services are good and, perhaps more important, steady.... There is a willing market for such services, and despite the social harm they cause, they may not be perceived by the public as a direct threat to individual or collective security. Indeed,

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[6]Mason Willrich and Theodore Taylor, *Nuclear Theft: Risks and Safeguards*, Ballinger Publishing Company, Cambridge, Mass., 1974, p. 112.

[7]Ibid.

> the existence of organized crime depends a great deal on tacit public acceptance or at least indifference and therefore it has tended to avoid criminal ventures—for example, in this country kidnappings for huge ransoms—that are likely to arouse public anger. Nuclear blackmail would bring tremendous heat on the organization and provoke crackdowns that could interrupt the flow of large steady profits from socially more acceptable crimes.[8]

Similarly, Lovett is very skeptical of the likelihood of organized crime involving itself in nuclear diversion:

> Organized crime will attempt nuclear diversion under one and only one condition, that it will bring more money. Organized crime has no use for nuclear material either as a blackmail threat or as a potential defensive or offensive weapon system. Nuclear material is of value to it only if it has a buyer.[9]

Lovett concedes, however, that a nonnuclear state or a terrorist group might employ an organized crime syndicate to divert nuclear materials in return for financial payment. But the buyers would not necessarily have to rely on *organized* crime. They could also recruit a band of independent criminals.

The twelve authors of a 1975 Mitre Corporation study, seven of whom were former FBI officials, dispute the belief that organized crime's alleged conservatism in politics or business would dissuade it from action involving nuclear material:

> There is little question that, for a sufficient amount of money, members of organized crime would take a contract to acquire special nuclear material for another party.... Organized crime shows little interest in its public image and would not be likely to be deterred from stealing nuclear material because the public might be outraged.[10]

If there is any area of consensus within the debate, it is that most observers believe that organized crime possesses the resources, skills, patience, and force necessary to steal nuclear material and engage in an illicit international trade of the commodity. The deterrents against nuclear theft, if there are any, appear to lie elsewhere: in possible fears by the leaders of organized crime that such actions would provoke public outrage and lead to severe responses that could seriously damage organized crime's other profitable enterprises.

At the same time, even those who believe that organized crime would hold back from direct involvement in nuclear theft or extortion concede the possibility that if a worldwide market for nuclear material develops, and if the price is right, organized crime might act as a "fence" or broker for the stolen goods.

In sum, the possible involvement of organized crime in nuclear theft or illicit trade in nuclear material would seem contingent upon (1) the continued expansion of the nuclear industry worldwide; (2) a restricted market in special nuclear materi-

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[8]Brian M. Jenkins, *Will Terrorists Go Nuclear?* California Seminar on Arms Control and Foreign Policy, Santa Monica, California, 1975, p. 10.

[9]James Lovett, "Who are the Enemy," in Leachman and Althoff (eds.), *Preventing Nuclear Theft: Guidelines for Industry and Government*, Praeger, New York, 1972, p. 215.

[10]S. Burnham et al., *The Threat to Licensed Nuclear Facilities*, The Mitre Corporation, McLean, Virginia, 1975.

al, which will keep the value of the commodity high; (3) the consequent necessity and profitability of an illicit trade; (4) a sufficient number of suppliers and buyers to sustain a market as opposed to an occasional one-time purchase; and (5) sufficient laxness in the area of security and safeguards to allow diversion of material for trade.

If the deterrents to nuclear theft or other nuclear action by organized crime lie in its natural concern about its other investments and its own survival, that may be an approach to explore. Apart from increasing security and safeguards, which many people currently consider inadequate compared with the capabilities of organized crime, we might ask what could be done to ensure that the leaders of organized crime fully understand that any involvement in nuclear crimes, like an armed attack upon the nation itself, could provoke an all-out attack on organized crime.

Chapter 4

PERSONALLY MOTIVATED ADVERSARIES: PSYCHOTICS

A third category of potential criminal adversaries are those individuals (and possibly groups) whose motivations we would classify as "personal," deriving from special psychological factors or from idiosyncratic experiences and perceptions. They include, for example, the disgruntled employee seeking revenge for a work-related grievance, the outraged citizen seeking to redress a perceived personal injustice by a public utility or governmental agency, and the psychotic individual who is out of touch with reality. This chapter concentrates on psychotics. (Chapter 5 includes a discussion of personal motivations for malevolent action by nuclear industry employees.)

Psychotics, driven by distorted perceptions of reality, might seek to damage nuclear facilities or use illegally obtained nuclear materials for destructive purposes. Fortunately, most clinically psychotic people lack the psychological organization and competence to plan and carry out such complex crimes. However, there are recorded cases in which the nature of the psychosis did not affect the individual's technical abilities. We have examined two such psychotic bombers, George Metesky, the "Mad Bomber of Manhattan" and Muharem Kurbegovic, the "Alphabet Bomber" of Los Angeles, as analogs of potential psychotic adversaries of nuclear programs. What follows is a synopsis of the two cases, emphasizing observations that are germane to the problem of nuclear crime.

George Metesky, tormented by what he perceived as a longstanding grievance against Consolidated Edison Company, conducted a sixteen-year bombing campaign. Metesky alleged that on September 5, 1931, while working in the boiler room at the Hell Gate power house of the United Electric and Power Company, which later became part of the Edison system, he was knocked down by a blast of hot gases. He contended that this experience led to his developing tuberculosis, which seriously disabled him. From November 16, 1940, until his capture on January 22, 1957, he built and planted over 32 homemade pipe bombs, 10 of which failed to detonate. Although his initial grievance was against Con Ed, his frustration and resentment intensified and he broadened his attack to include the public at large. By the time he was captured, his bombs had injured at least 14 people and caused the New York Police Department to mount the largest manhunt in its history.

Muharem Kurbegovic, a 31-year-old Yugoslav immigrant, was arrested August 20, 1974, for a bombing at the Los Angeles International Airport. On August 6, at 8:10 a.m., a bomb left in a public locker in the overseas passenger terminal lobby of Pan American World Airways exploded with tremendous force. Three were killed and 35 were injured in what was described as the deadliest explosion in a decade of violence in the Los Angeles area. Several hours later, a man with a foreign accent telephoned the Los Angeles *Herald Examiner* to claim credit. He later identified himself by tape and other phone calls as Isaac Rasim, spokesman and chief military officer of an organization he called "Aliens of America." He

demanded better treatment for aliens in the United States, abolition of sex laws, and murder indictments against two former police officials who had shot two Mexican aliens in 1970. In a taped message, he also said, "the Supreme Court has repeatedly ruled that an alien is not a human being. . . ." He also criticized Congress and warned that if corrective action were not taken in three months, nerve gas would "destroy the entire personnel of Capitol Hill." Two tons of a gas called Sarin would be transported from St. Louis and would be fired from eight single-shot cannon barrels. He stated that "meanwhile we will have to write our name on the face of this nation in blood." His targets, he said, would spell out Aliens of America: "A" was for airport; "L" was to be for the locker at the downtown Greyhound bus terminal where he had planted a bigger bomb than at the airport. (He was later known as "The Alphabet Bomber.") Because of his warning telephone call, police were able to locate and remove the bomb from the bus terminal.

Analysis of these two cases reveals a number of parallels that are relevant in contemplating the potential for antinuclear crime by psychotics:

1. Both men were psychotic prior to and during their technically sophisticated bombing campaigns. Their psychoses apparently did not degrade their technical performances over time, nor did it stand in the way of upgrading their criminal skills and techniques.
2. Both men had personal grievances that ballooned into public vendettas. Metesky became frustrated after many years of unsuccessfully pursuing a compensation claim against Consolidated Edison Company for a chronic lung ailment he believed was caused by an industrial accident. Kurbegovic, after being denied a permit to operate a taxi dance hall because of a previous sex offense arrest, began a personal campaign of retaliation against those he thought had blocked his request.
3. Both men were loners. Metesky had no friends but his sisters. Kurbegovic maintained a "mute" employee relationship at work, but did occasionally speak to people around his apartment. The contact with taxi dancers was part of his aberrant sexual style and not an attempt to form a relationship with another person.
4. Both men embarked upon a campaign of criminal actions against their respective targets, rather than engaging in a single act. Metesky carried out his actions over a 16-year period. Kurbegovic was in the early stages of action, which started three years before with his unsuccessful attempt to bomb the car of a police commissioner.
5. Both men demonstrated technical competence in the design and manufacture of their devices. Metesky's devices were easily identified by the careful workmanship of the machined parts. Kurbegovic combined his knowledge of explosives with his engineering background to develop a very lethal bomb consisting of high explosives and propane.
6. In each case, the bombing campaigns demonstrated an increase in technical sophistication over time. Metesky developed a simple but very reliable timing device and a procedure for activation that afforded maximum protection to him. Kurbegovic planted a bomb in the Greyhound bus terminal which, if detonated, would have been many times more destructive than the one he exploded at the Los Angeles Airport.

7. Both men were functional in society. Although Metesky's behavior was viewed as strange, and the neighborhood children regarded the old house he lived in as a haunted house, he was neither inappropriate in dress nor bizarre in manner. Likewise, Kurbegovic's dress and mannerisms did not seem strange to anyone; even his muteness was accepted by his fellow workers. Those who knew each man were surprised that he was a "bomber."
8. Both men were aware of social issues and incorporated them into their campaigns. During the war years, Metesky suspended his bombing campaign for patriotic reasons and even worked a brief time in a defense plant. Kurbegovic, motivated by his own fears of deportation because of sex offenses, was knowledgeable and concerned about the plight of aliens in the United States.
9. In both cases there was an interaction and communication with the press. Metesky sent letters to the press; Kurbegovic sent tape recordings to the press. Both had telephone contact with particular newsmen at a local newspaper. Each needed an arena to justify his side of the bombing campaign and a channel to issue warnings of impending explosions.
10. Each man was lethal. Although some of Metesky's first bombs fizzled and others contained only a small charge, his later bombs were capable of causing death. It was only by chance that Metesky's devices did not kill. There was no question about Kurbegovic's capability and intent to kill.
11. At the time of capture, both men had stepped up their activities. Metesky heightened the frequency of his bombings during the last two months of his campaign and indicated he would go after a broader range of targets. Kurbegovic had just planted a huge bomb in the Greyhound terminal and had assembled all except one of the ingredients for making nerve gas.

The available documentation makes it evident that both Metesky and Kurbegovic were psychotic during their bombing campaigns. Both exhibited behavior consistent with the diagnosis of schizophrenia, paranoid reaction. Each had an internal logic based upon a perceived wrong. The actions that each carried out were, in his own mind, justified and relevant to his perceived grievance.

The two men's psychoses appear to have disintegrated the normal personal and societal constraints against committing acts of mass murder and mass destruction. It is not uncommon for the delusional system of certain psychotics to have grandiose qualities of such magnitude that the individual believes he is chosen by God to carry out divine vengeance against a sinful world. In such cases, the psychotic person can pursue his "righteous goals" with the fervor of a religious fanatic, completely unfettered by societal constraints or personal guilt over the disastrous consequences of his actions.

A feeling of omnipotence is another quality often seen in such psychotics, and was clearly present in the psychotic process of Kurbegovic. This quality of feeling all-powerful could be the basis for some psychotics being attracted specifically to things nuclear, because of the tremendous power developed by a nuclear explosion. The large majority of psychotics with the type of paranoid delusional system discussed here are impelled to take action against a person or group if they believe them to be the cause of their "suffering" or if they believe they have been directed

to do so by some inner voice, which they may perceive as God. In either case, the action taken is almost always destructive, instead of constructive, such as counseling or educating their adversary.

To a deranged mind that deals in absolutes, ultimates, and coercion, nuclear material (or a nuclear-related capability such as a radioactive dispersal device) could be the perfect coercive or intimidating instrument. It would fit the psychological dynamics of such a functional psychotic.

For these reasons, the *dysfunctional* psychotic, who is unable to make a real threat, might derive some satisfaction or a sense of accomplishment by making a hoax threat based on nuclear power (see Chap. 8).

Assuming that the functional psychotic could solve the enormous technical problems of acquiring a nuclear explosive capability (developing a nuclear dispersal capability would present fewer technical obstacles), his peculiar delusional system and seriously eroded social constraints would make him an unpredictable and potentially lethal criminal adversary.

Chapter 5

HOSTILE EMPLOYEES AS POTENTIAL ADVERSARIES

There is a simple way to penetrate the most secure system of fences, gates, guards, sophisticated monitoring equipment, and other safeguards. There is a way of learning where sensitive information and materials are kept, and of entering secure areas unarmed, without resorting to force. It is the same way by which one can gain considerable knowledge about a facility, its operations, and the various uses, value, and location of nuclear materials. All of those things are done every day in every nuclear facility—by its employees.

Of course, few of these employees are likely to harbor criminal intentions against their employers or nuclear programs generally. Because they represent a special security risk, however, this chapter examines those few employees who, for various reasons, might commit nuclear-related crimes. As we shall see, their motives may run the gamut of those discussed in the previous three chapters: ideological, economic, personal.

Employees who turn against employers or the system the employer represents can do a great deal of damage. The hostile employee is generally trusted, has knowledge of vulnerabilities, has access to both information and facilities, can often operate undetected for long periods of time, and, having turned against the system or employer, may carry out malevolent actions with the self-righteousness and zeal of other kinds of fanatics.

Whether the wrongs done to them are real or imagined, hostile or disgruntled employees often act out their aggression against either specific individuals or the system. The system may be represented by the employee's department, a particular plant or building, an entire corporation, "the government" in general, or individual "authority figures."

Resentment is sometimes focused on specific individuals whom the hostile employee blames for causing the problem. In other cases, the hostility is much more diffused and may be acted out against authority figures who represent the system. Not all hostile employees choose personnel as targets; some attack property, often through bombing, arson, or sabotage, or the system itself, perhaps by causing embarrassment to it; or they may resort to more indirect actions such as espionage, providing information to criminals or foreign agents.

One of the special dangers in this regard is that the consequences of a low-level action may far exceed what the perpetrator intended. Turning a valve to "cause some mischief" could end up being very costly; or an attempt to release a small amount of radiation to demonstrate safety hazards could go wrong and cause disastrous contamination.

TYPES OF HOSTILE EMPLOYEES

In the remainder of this chapter, we attempt to:

- Classify several types of hostile employees according to motivational pattern, and
- Describe the type of individuals found in each group and the hostile actions they are most likely to take, giving examples of analogous past incidents.

Although we have examined many such incidents, we have focused here on the more serious ones.

We have categorized motivations in this discussion only for expository convenience; we of course recognize that people are complex and rarely fit neatly into such schemes. Multiple, overlapping motives regularly underlie even the most commonplace of actions. Also, one could easily make the case that many so-called hostile employees should instead be classified as psychotic personalities because their hostility stems from mental disturbance, not actual mistreatment by the employer or system. The Mad Bomber of New York mentioned previously is one of many examples of the undoubtedly hostile but psychotic ex-employee campaigning on behalf of his or her cause.

For our present purposes, the employee as a threat per se will be treated without elaborating on the psychological base that causes people to take aggressive, destructive, aberrant action. We have distinguished, where possible, among various driving motives of hostile employees, because different motivations represent differing types of threats (both in degree and in duration), likely targets, types of destructive behavior, and predictability. The motivational groupings we will consider encompass employees who are:

- Emotionally unstable
- Disillusioned
- Frustrated
- Self-serving
- In labor-related situations
- Agents
- Acting for idiosyncratic reasons
- Coerced

We should keep in mind, of course, that numerous employees may fall into one or more of the above categories but never take hostile action. For example, an employee may feel painfully frustrated but never even contemplate hostile action. Most employees do not do so, even in times of considerable stress with the employer. We are looking at the very few who, for various reasons, do act out their aggressions.

Emotionally Unstable Employees

Although screening can eliminate many undesirable applicants for employment, it is not infallible; among a large number of employees, a scattered few almost surely will suffer some mental illness or emotional instability during their term of employment. Such employees may engage in hostile actions that may take many forms.

Occasionally, there will be a one-time episode. A possible example of this is an incident that occurred in 1961 at the National Reactor Testing Station in Idaho. A surge of power burst the reactor vessel and killed three persons on the operating floor of the plant. The initial investigations concluded that the incident may have been caused by one of the operators deliberately removing one of the control rods, thereby causing the fatal surge of power.

Another example was the $5 million fire in Nuclear Power Plant No. 2 at the Consolidated Edison Indian Point Plant in New York. Almost three months after the fire, a seven-year employee of Con Ed committed himself to a V.A. hospital for psychiatric treatment. He was arrested shortly thereafter and pleaded guilty to arson.

If a psychotic employee (or ex-employee) is able to function in society as a not obviously clinically disturbed individual, he or she may go on committing crimes for years without detection, as did Metesky, the Mad Bomber.

Putting aside the issue of capabilities, we would expect the following to be among the most likely actions contemplated by the psychotic employee:

- High-level sabotage leading to the release of radioactive materials;
- Low-level standoff attack (e.g., with rifles);
- Armed assault;
- Threats against facility personnel;
- Assassination of personnel;
- Armed occupation of facility and perhaps seizure of hostages;
- Hoax bombing threats against a nuclear facility;
- Hoax nuclear threats;
- Destruction of physical facilities.

One further observation is that the psychotic employee usually acts alone.

Disillusioned Employees

We consider disillusioned employees as those who are philosophically "out of sync" with the system, although they have in the past "believed" in the system. Most of them are idealists, sincerely interested in what they consider to be the best interests of all involved. They may hold high positions in the organization. When, from their viewpoint, they see wrongs being done, a typical first reaction is dismay, followed by efforts to work from within to correct the system. Normally, if those efforts fail, the disillusioned employee either subsides into cynicism or quits and seeks a more compatible position. A few, however, may be willing to break the law in hopes of rectifying perceived problems, either while still within the organization or after leaving it.

The working conditions of installations with tight security and limited access both to information and physical areas, the presence of armed guards, and the need for complete background investigations may exacerbate paranoid tendencies in employees who are already inclined in that direction. Such people may then start believing what antagonists are saying about the system and become disillusioned with it. The latent paranoid personality is also more inclined to take some sort of action to right perceived wrongs if the psychological condition becomes acute, or

"focused." That action is unlikely to be violent unless the paranoia has become psychotic; at lower levels of disillusionment, the following types of actions would seem more likely:

- Disclosure of proprietary or even classified information;
- Formation or support of antagonistic groups whose members are engaged in or planning to engage in criminal actions;
- Espionage (not limited to foreign powers); as the term is used here, it would include such things as providing classified information to any group intent upon sabotage.

Frustrated Employees

The distinction between disillusioned and frustrated employees is based mainly on the difference between the philosophical and the personal. An individual may feel personally threatened or mistreated and choose not to leave but to try to rectify alleged wrongs; if encountering little success in changing the situation, the frustrated employee may well turn to more hostile actions.

This is particularly true of people who believe that they are being subjected to unsafe conditions. In one very controversial incident, uranium dioxide pellets were found on the grounds of a nuclear plant outside the production area. This discovery followed the death of an employee who was killed in an automobile accident on her way to inform a newspaper reporter of allegedly unsafe conditions at the plant where she was employed.

As noted in Chap. 3, the temporary employee who stole 150 pounds of uranium dioxide from the General Electric Fuel Processing Plant in Wilmington, North Carolina, was upset over his being terminated ahead of schedule. It appears that, in addition to having a financial motive for extortion, he was intent on getting revenge for what he perceived as mistreatment by the plant manager, whom he considered responsible for the termination decision.

Several incidents in our data base were hostile actions taken because of similar frustrations. In several incidents, someone other than the terminated employee made bomb threats or committed other hostile actions in reaction to what was viewed as an unfair termination.

The hostile actions taken by frustrated employees cover a wide range and are largely influenced by the extent of accompanying psychosis. The actions would include:

- Vandalism
- Extortion
- Low-level (and perhaps high-level) sabotage
- Threats against facility personnel
- Assassination of personnel
- Hoax bombing threats against a nuclear facility
- Hoax nuclear threats
- Destruction of physical facilities

Self-Serving Employees

Self-serving employees include all those who take action that is detrimental to the system to gain something for themselves. Examples range from the guard who stages an attack so that he can receive a reward for the role he claims to have played in thwarting the incident, all the way to the person who becomes an employee in order to carry out a criminal act at some later date, such as stealing nuclear materials. The nuclear industry also has a large pool of temporary or peripheral employees—contract personnel, construction crews, etc.—whose tenuous commitment to the industry might make them prone to engage in crimes for immediate economic gain.

There are instances to date where employees were involved in the theft of nuclear material. For example, one of the two men responsible for the theft of fuel elements from the Bradwell nuclear plant in England was an employee (see Chap. 3).

In nonnuclear high-value theft, it appears that inside assistance is often an essential part of the operation. Often, the "insider" is recruited by promise of financial gain, as in the Lufthansa theft. Generally speaking, this type of person has little regard for societal right and wrong, and feels that it is natural to better oneself by any means, whether legal or illegal. Self-serving employees who can do the most harm are those with a clearly criminal bent. Their hostile actions could include the following:

- Pilfering of nonnuclear material (e.g., tools, generators)
- Removal of nuclear material or SNM
- Kidnapping of personnel
- Hoax nuclear threats
- Hoax sale of SNM
- Espionage

Employees Who Are in Labor-Related Situations

Hostile actions of a labor-related nature are usually short-term, but can be highly volatile and damaging. Here again we are faced with those who know the system and its vulnerabilities, have access to the facilities and sometimes to material, and whose hostile actions can therefore cause considerable disruption. Some employees may have stronger allegiance to their union than to their employer or the system, and therefore consider the labor-related action as a means justified by the end. In labor-related activities, the goal of those who view the employer as an adversary is often to undermine the system so as to gain the upper hand in negotiations. Although the actions may not be directed or even sanctioned by union officials, some more zealous members may take it upon themselves to use violent means as a way to further the union cause.

Our data base reveals numerous incidents of sabotage and violence by employees during labor-related conflict. For example, in 1959, the nuclear submarine *Nautilus*, in Portsmouth, New Hampshire, for overhaul, was damaged by a series of fires, broken pipes, and severed cables in the machinery space of the submarine,

although not in the reactor area. Damage was attributed to disgruntled civilian workmen, dissatisfied with furlough policies and low wage rates.

During 1963-1964, a strike by the National Railway Brotherhoods against the Florida East Coast Railway was marked by a lengthy campaign of violence. The management continued to operate trains without union employees, and by mid-1964, 250 acts of harassment, vandalism, and sabotage had occurred. Among the more serious incidents were shooting at train engineers, derailments caused by dynamiting trestles as trains passed over, and the dynamiting of a 50-car freight train. The FBI arrested four union members in the act of planting dynamite on a trestle and charged them with conspiring to blow up a company train. In the nuclear industry there is the possibility that labor-related strife could engender disruptive or violent acts by employees. This could well include such crimes as hijacking trucks carrying SNM, sabotaging a facility, and the like. The duration of labor-related actions is closely correlated with the length of time that the labor trouble exists, although there may be times when residual bitterness lingers and causes individuals to persist in their disruptive activities. The types of activity to be concerned about would include:

- Vandalism
- Low-level sabotage that is intended to halt operations temporarily
- Low-level standoff attack
- Hijacking
- Threats against facility personnel
- Hoax bombing threats against a nuclear facility
- Hoax nuclear threats
- Destruction of physical facilities

Employees Who Are Foreign Agents

The role of foreign agents is self-evident. They obtain either sensitive information or materials and pass them on to another country. They are also available for sabotage activities in the event of hostilities involving their nation and the United States. Allegations of foreign agent activity have been raised in connection with some 200 pounds of highly enriched uranium that was unaccounted for during the 1960s at the NUMEC fuel processing plant in Apollo, Pennsylvania. It was speculated that an agent or agents within the company helped to divert the material to Israel; however, after intensive investigations by federal law enforcement agencies, the Nuclear Regulatory Commission concluded that, "There is no conclusive evidence that a diversion of a significant amount of SSNM either did or did not take place."[1]

Types of hostile actions that employee agents might undertake would include:

- Low-level sabotage that is intended to halt operations temporarily
- High-level sabotage that leads to the release of radioactive materials
- Removal of SNM

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[1]John J. Davidson, *Safeguards Summary Event List*, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, NUREG-0525, May 1979, p. 58.

- Destruction of physical facilities
- Espionage

Employees Acting for Idiosyncratic Reasons

Employees who represent a threat to the system because of their idiosyncratic behavior would probably be motivated by a need for excitement and challenge, although in some cases they might also be under the influence of drugs. This behavior might well be mixed with a degree of exhibitionism. However, others would find excitement in doing something illegal and dangerous without getting caught. As mentioned in Chap. 3, many bank robbers, burglars, and other criminals are motivated as much by the thrill and challenge as by the financial gain. When the stakes are high, some people may consider it a personal challenge to outwit a system, and spend a great deal of time and energy to prove themselves superior to those who are trying to make the system invulnerable. Such people are likely to be above average in intelligence and averse to violence.

At the bottom of the scale are those who would get a thrill out of calling in a bomb hoax against a facility, while at the top of the scale might be those who are determined to beat the security system and have as a goal the theft of SNM or classified information, possibly through manipulation of the computer system. Some bright and knowledgeable individuals might wish to construct their own nuclear device and win the world's admiration for their skill.

All such idiosyncratic employees represent some degree of threat to the system. Some are more numerous than others and represent mere nuisances to the system (e.g., the constant calling in of bomb threats to facilities). Fortunately, at this time, there are no proven cases of incidents at the top of the scale mentioned above (theft of SNM or construction of an improvised nuclear device by employees). However, non-employees, for whatever reason, have attempted to design nuclear devices and the possibility therefore has to be considered that sooner or later an employee or ex-employee might attempt the same.

It is conceivable that in some instances in the data where theft of nuclear material has occurred, an employee has been implicated, whether for financial gain, excitement, or some other reason. The excitement may be of the "cops and robbers" variety, or the secret "fun" of knowing that they are the ones responsible for a big news item. The various predicted actions of a hostile nature to the system would include:

- Vandalism
- Low-level sabotage that would halt operations temporarily
- Removal of SNM
- Diversion of SNM within a facility
- Hoax bombing threats against a nuclear facility
- Hoax nuclear threats
- Disclosure of sensitive or classified information

Employees Who Are Coerced

Against their will, it is possible that employees could be blackmailed or otherwise coerced into hostile actions, and they are therefore included here. Our data

contain no such incidents for nuclear facilities, but they are certainly frequent in other areas of employment.

In recent years, for example, there have been several instances when the families of bank employees have been held hostage in their own homes while the criminals made demands in return for their safety. It is conceivable that criminals might threaten harm to nuclear employees or their families unless the employees cooperated in giving information or materials to the criminals, or performed hostile actions. Such actions might include:

- Removal of small amounts (less than strategic) of SNM
- Removal of a large quantity (strategic level) of SNM
- Destruction of physical facilities
- Espionage

DURATION OF HOSTILE ACTIVITIES

Single-Occurrence Actions

Single-occurrence actions by hostile employees are usually impulsive or psychotic (episodic) in nature. They more than likely stem from extreme anger or bitterness, and are usually triggered by a particular event. The response is to some wrong or perceived wrong, unless the individual is so psychotic that he or she has gone completely berserk or feels compelled to carry out orders given by inner "voices." There is a high probability of identifying the perpetrator because, in view of the motivations, the person is less concerned about being caught than about wreaking havoc. This is particularly true if the hostile action follows quickly on the triggering event. If an employee is discharged in the morning, causes a ruckus and yells threats, and arson is attempted that night, the suspect is obvious.

A different type of single-occurrence action is both more serious and harder to detect. A carefully planned large theft, for example, may involve an employee as a one-time participant (or he may even be acting on his own). If the theft is successful, establishing who is responsible can sometimes be extremely difficult. The self-serving employee is also a candidate for a single-occurrence action, as in the case of a guard who stages a bogus incident in which to appear a hero.

Because single occurrences happen only once, it is often hard to track down the culprits. No pattern can be established, no stakeouts can be set up, nor can many other crime detection or prevention techniques be used to good advantage.

Short-Duration Actions

Short-duration actions, like the single occurrence, are often born of a specific situation, and so may continue until the situation is resolved (e.g., the settling of a bitter labor dispute). Or the actions may stop when the person tires of the game, worries about being caught, or feels that he or she had extracted "the pound of flesh" due. Hostile incidents range from nuisance acts (e.g., repeated bomb hoaxes), through arson, bombings, and attacks on personnel. Motives are approximately the

same as in single-occurrence actions, but more intensified. Of the hostile employee groups, psychotics would certainly be likely to attempt short-duration acts; criminals, frustrated employees, and employees in labor-related situations might also take short-duration actions.

Campaigns Waged Over a Long Time Period

Campaigns waged over a long time period could also range from nuisance acts to seriously disruptive incidents, such as arson and bombings. The campaigns are not so much angry responses to situations as they are vendettas against employers or former employers. Along with the agent, who might be involved in long-term hostile actions, we would expect the psychotic to be so dedicated to a cause that he or she would spend the time and effort needed for long-term action. Also, the psychotic's intensity of feeling would often result in serious types of hostile incidents. Such people have not been easily apprehended in the past (nonnuclear incidents). If they are functional in society and the perceived wrong triggering the situation is not apparent, they may continue to attack the system for years.

The Time Element

All three of the above actions (single-occurrence, short-term, and long campaign) may be preceded by a lag time during which the individual's resentment builds until it explodes into action. For example, an employee may be discharged for what is felt to be insufficient reason, but keep his or her anger under control. If the person persists in brooding about it, however, and is perhaps reinforced in his or her anger by friends or a spouse, the ex-employee may reach the point where some sort of retaliation seems justified. The form of that retaliation would probably be largely a function of the individual's personality and general mental health.

Time-Span Matrix

Below is a matrix that attempts a theoretical prediction of what the time span of actions might be for the types of hostile employee outlined in this report.

Type	Single Occurrence	Short Term	Long Term
Psychotic	Very high	Some	High
Disillusioned	Low	Low	High
Frustrated	Very high	Some	Very low
Self-serving	Very high	Low	Very low
Labor-related	Very high	Very high	Very low
Agent	Low	Low	Very high
Coerced	Very high	Some	Low

TWO SPECIAL CONSIDERATIONS

Internal Conspiracies

This chapter has described motivational patterns that could impel nuclear industry employees to criminal actions, concentrating on the motivations of *individual* employees. The possibility that several insiders might conspire in a crime poses an additional level of threat because several employees, working together, could undertake more complex actions and inflict more serious damage.

Most of the employee motivation categories (the psychotic seems the exception) could readily include two or more people working together. This seems especially true for employees who are disillusioned, frustrated, self-serving, or in labor-related situations. Two workers who poured a caustic solution on stored fuel assemblies at the nuclear power plant in Surry, Virginia, in 1979, causing $1 million damage, claimed they did so to demonstrate the inadequacy of plant security—putting them in the disillusioned category. It is also not difficult to imagine cooperation between employees with differing motives—one of them self-serving, for example, and the other frustrated for job-related reasons.

Internal conspiracies may evolve either because of practical necessity (perhaps more than one person is needed to implement a criminal plan) or the need for psychological reinforcement, or both. Youngsters' penchant for saying "I'll do it if you will" carries over to the adult world; there, too, people may "egg each other on."

Although a hostile employee considering criminal action stands to gain something—in terms of both logistical and psychological support—by enlisting one or more confederates, he also increases his risk. There is the danger of misreading a potential ally who, when approached with an illegal scheme, will report it to the authorities. And the more people involved in a plan, the greater the chances of information leaking outside the group.

"Grab-and-Run"

As in cases of other types of robberies and thefts, it is conceivable that an insider (perhaps even a visitor) might, if portable amounts of nuclear materials should be within his reach, grab them and run. In doing so, he may follow either a sudden impulse or a preconceived plan. He also may follow a sudden impulse *within* a preconceived plan: He might have been thinking for some time about stealing materials, and suddenly see an unexpected chance.

A "grab-and-run" attempt may be all the more tempting for an adversary if—as is not particularly likely—the materials are somewhere near an exit, so that the "run" would not have to be too long. And the temptation might be heightened further by the fact that guards in most facilities cannot operate beyond the facility itself and therefore cannot engage in hot pursuit, and that it would take time to alert the regular police beyond the gates. Another element for consideration is that guards in some situations are not permitted to use deadly force in the case of a fleeing perpetrator inside a facility. However, one cannot predict what an individual guard will do (or not do) in a crisis situation.

"Grab-and-run" actions could have all sorts of motivations, such as the hope of economic gain, political considerations, idiosyncratic quirks, or the onset of a psychotic episode. The central question, however, is credibility. An adversary who is motivated by economic gain or political considerations probably would prefer to engage in diversion or other forms of theft. But an impulsive action, sparked by the sight of a "target of opportunity," cannot be ruled out. In fact, as already indicated, it cannot even be ruled out that a "grab-and-run" action could be the result of a *preconceived plan*, if the grabbing and running should be a relatively easy or the only way to obtain materials.

Chapter 6
POTENTIAL ARSONIST ADVERSARIES OF NUCLEAR PROGRAMS

This chapter examines the arsonist as a potential adversary of nuclear facilities and programs and speculates on the possibility that fire (nuclear and nonnuclear) might be used to sabotage, to register an antinuclear protest, to cover another crime (such as theft of nuclear material), or to perpetrate mass murder or other crimes.

Arson is a major crime. It has been called America's fastest-growing crime by an official of the Law Enforcement Assistance Administration, and the nation's costliest crime by a representative of the International Association of Fire Fighters. According to some statistics, it kills more than 1,000 persons a year, injuries 10,000, and costs an estimated $1.5 billion.[1]

What are the possibilities that arsonists might use ordinary "earth" or extraordinary (nuclear or "sun") fire to attack nuclear facilities or programs or to threaten the general population?

To get at the first possibility (the use of ordinary fire), we ask ourselves:

- Are nuclear facilities vulnerable to fire? The serious vulnerability of nuclear plants to fire was well illustrated by the Brown's Ferry nuclear reactor fire of March 1975. A fire set accidentally caused damage that in the judgment of the Nuclear Regulatory Commission "made several safety systems inoperative." There was no release of radioactivity but repairs took a number of months.
- Have there been incidents of arson at nuclear facilities?
- What are the motivations and what is the demographic and psychological profile of the "ordinary" arsonist, including the pathological arsonist, the criminal who sets fires to cover other crimes, the arsonist for profit, the arsonist for hire?
- What are the possibilities that any of these types of ordinary arsonist would be found at nuclear facilities, as an employee, for example, or would attack nuclear facilities?

To examine the second possibility, the possible use of extraordinary (nuclear or sun) fire, we review briefly the special relationship between fire and religion and speculate about the potential nuclear arsonist who might be driven to use a fiery instrument of extraordinary power because his world view may be such that ordinary "earth fire" will not suffice. His fantasies may be so grandiose that he believes only "sun fire" is suitable for the kind of mission he contemplates.

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[1] *Los Angeles Times*, May 6, 1979.

INCIDENTS OF ARSON AND ARSON ATTEMPTS AT NUCLEAR FACILITIES

During the period 1969-1975, there were 22 recorded incidents of arson, attempted arson, and suspicious fires at nuclear energy facilities or directed against facilities related to nuclear programs.[2] Most of the apparent arson incidents occurred in buildings where the Atomic Energy Commission rented offices, or were directed against university nuclear research facilities, such as the University of California's Lawrence Radiation Laboratory, which was a frequent target, with 10 actual or attempted arson incidents. Investigators suspect that the fires were set either by former employees with personal grievances or militant students opposed to nuclear research being conducted by the university.

The most serious incident of arson at a nuclear facility occurred at Nuclear Power Plant No. 2 at Indian Point, New York, not then in operation. In November 1971, a fire was set in a wooden shed in an auxiliary building located about 100 feet from the main reactor. The fire caused between $5 million and $10 million in damage to the facility but did not affect the reactor or cause any radioactive leakage. A subsequent letter to the press claimed that "Indian Point Guerrillas" were responsible for the incident and suggested that the action had been motivated by concern for the environment. However, the arsonist, who was apprehended when he turned himself in for psychiatric treatment at a local veterans' hospital about three months after the fire, turned out to be an operating mechanic and maintenance man at the plant. He had been an employee of Consolidated Edison for seven years. He was 27 years old, an Army veteran, married, the father of three children, and a longtime resident of the area. He turned in the alarm and was among the first to fight the fire. He acted alone, and made no warnings or threats.

Outside the United States, incidents of arson or suspicious fires related to nuclear programs include a series of fires between June and November 1977 that delayed the completion of Brazil's first nuclear power plant at Angra dos Reis. Brazilian press reports called the incidents "sabotage" but did not name a suspect.

TYPES OF ARSONISTS, THEIR MOTIVATIONS, AND THEIR POTENTIAL THREAT TO NUCLEAR PROGRAMS

The Pathological Firesetter

Pathological firesetting is a well-researched area. Most of the studies confirm what Lewis and Yarnell established as the profile of the kind of arsonist who is sometimes called a "pyromaniac" or "firebug." Such people are defined by Lewis and Yarnell[3] as "offenders who said they set their fires for no practical reasons and received no material help for the act. Their only motive was to obtain some sort of sensual satisfaction." Bernard Levin,[4] of the Center for Fire Research, National

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[2]Rand Nuclear Incident Chronology.

[3]N.D.C. Lewis and H. Yarnell, *Pathological Firesetting (Pyromania), Nervous and Mental Disease Monographs*, Coolidge Foundation, New York, 1951.

[4]Bernard Levin, "Psychological Characteristics of Firesetters," *Fire Journal*, Vol. 70, No. 2, March 1976, pp. 36-41.

Bureau of Standards, describes the Lewis and Yarnell work as the only study that covers a wide range of motives for firesetting and includes a large number of cases (over 1,300—1,145 men and 201 women). Lewis and Yarnell classified over half of the men in the study as "firebugs," that is, arsonists who repeatedly set fires without any real motivation except to satisfy some inner psychological need—what some of them called "an irresistible impulse."

The pathological firesetter usually works alone and at night. His firesetting is not carefully planned. He uses materials at hand and lights his fires in easily accessible places.[5] Battle and Weston[6] state:

> Insofar as a layman is concerned, pyros are usually classified in accordance with the extent of their mental derangements or the basic factors leading to their firesetting. The "psychotics" suffer from such defects of reason as not to know the nature or quality of their acts. Better able to distinguish between right and wrong are the morons, imbeciles, and feeble-minded individuals who are grouped together and classed as mental defectives. In descending order follow the "sex pyros," the "hero," and the "would-be fireman" and lastly, the juvenile firesetters with indications of pyromania.

Most researchers agree that the following factors, summarized by Battle and Weston, are almost always present in the firebug's profile:

- Poor home life or no real home at all: Vagrants are more likely to desire the destruction of other people's homes.
- Unemployment.
- Confused sex life: The pathological firesetter may find it difficult to establish a normal heterosexual relationship "because of extreme shyness, partial impotence, or fear of acquiring a venereal infection."
- Excessive use of alcohol: The ordinary firebug often uses alcohol to help him "get up the courage." The designation "alcoholic pyro" in the Battle and Weston study describes someone who is "generally rational insofar as an urge to set fires is concerned, but who becomes a victim of pyromania after taking a few drinks."

Motivations. Battle and Weston present motivations for each type of pyro:

- Psychotic: probably activated by some inner drive of a delusional character;
- Mental defectives: some for the excitement and noise of the event, or merely to see a fire;
- Sex pyros: for sexual satisfaction. "In reality," say Battle and Weston, "the sex pyro is a fetishist."
- Vanity firesetters: inadequate personalities who want to be big heroes; would-be firemen who get great satisfaction out of helping firemen at the scene of the fire. "Basically, they are exhibitionists and their 'public' is a necessary adjunct to their exhibitionist tendencies."

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[5]Donald Scott, *The Psychology of Fire,* Charles Scribner's Sons, New York, 1974, p. 95.

[6]Brendan P. Battle and Paul B. Weston, *Arson: A Handbook of Detection and Investigation,* Arco Publishing Co., Inc., New York, 1978, p. 92.

Threat to Nuclear Programs. It would appear that even a preliminary screening might winnow out the classic pathological arsonist at a nuclear facility. Most statistics indicate that his intelligence is low, his work history irregular, and his use of alcohol excessive. He is usually an unskilled laborer who is unable to cope with most social situations. He is unlikely to be found in the professional ranks but might possibly be employed in a custodial capacity. Although most of the characteristics of the Indian Point employee-arsonist did not fit the profile of the classic pyromaniac, two characteristics were typical: He turned in the alarm, and was among the first to fight the fire. Such information is available only after the fact, of course.

Because the firebug usually works his mischief in easily accessible spots, he would be ineffective against a closely secured facility; we might therefore eliminate, as a serious threat, the classic pyromaniac who does not have access as an employee.

The Arson-for-Profit Firesetter

Arson-for-profit is considered to serve a rational purpose, and therefore is not classified as pathological firesetting. According to Bernard Levin, arsonists for profit, the most rapidly growing group of arsonists, include, among others: (1) businessmen who set fire to their own businesses to collect the insurance; (2) businessmen who hire paid arsonists for the same reason; (3) paid arsonists who set fires for a fee; (4) criminals who set fires to destroy evidence of other crimes.

The arsonist for profit is probably a minimal threat to nuclear programs. His usual motivation, compensation through insurance payments, would not apply. Conceivably, although it is not likely, he could profit by an extortionist threat of arson; that is, an economically motivated adversary could practice a variation of the protection racket against nuclear facilities or personnel.

Arson for Revenge, Crime Concealment, or Malicious Mischief, or Related to Employee Grievances

James A. Inciardi studied 138 sentenced arson offenders who were released on parole from the New York State prisons from 1961 through 1966.[7] His overall findings parallel those of the studies cited above, noting the behavioral pattern common to many firesetters: no marital ties, problem drinking, irregular work habits, and a nomadic way of life. Three categories of motivations identified in Inciardi's sample seem relevant in the nuclear context: revenge, crime concealment, and excitement.

Revenge. "Revenge," "spite," and "anger" are three subcategories of what Battle and Weston call the "hate" motive; they differ in the length of time elapsed between the alleged grievance and the setting of the fire.

An "anger fire" is usually set within minutes or hours of the incident that has enraged the arsonist, who commonly is well known to the victim. A "spite fire" is usually set within hours or days. The arsonist may or may not be known to the victim. A "revenge fire" is set by a person who may have carried a grudge for years.

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[7]James A. Inciardi, "The Adult Firesetter, A Typology," *Criminology*, August 1970, pp. 145-155.

Of the arsonists studied by Inciardi, 58 percent were motivated by revenge. In the "revenge fire," the desire to kill, maim, or damage irreparably predominates. A member of the National Fire Prevention and Control Administration in Washington recently stated that arson was "becoming a common way to settle grievances and quarrels. Before, people who wanted revenge would shoot their enemy. Now they burn him out."[8]

Crime Concealment or Diversionary Tactic. Arson is often used to destroy records or the evidence of another crime or to prevent identification of a body. It may also be used to distract watchmen or guards during the commission of a crime. Crime concealment was the motivating factor for 7 percent of Inciardi's arsonists.

Excitement. Excitement motivated 18 percent of Inciardi's sample arsonists. It may be that emotional immaturity and inability to endure tedium relate this group of arsonists to juvenile firesetters (discussed below). The excitement firesetters also represented the highest percentage of problem drinkers in the Inciardi study (91 percent).

Employment-Related Grievances. Arson is a very common instrument of sabotage in connection with work-related grievances. A recent example is the series of fires aboard the aircraft carrier *John F. Kennedy,* which had been docked in Portsmouth, Virginia. There had been 11 cases of arson in the three months preceding the *New York Times* account printed on June 18, 1979. A civilian shipworker was killed in April in one of the fires. More than 30 sailors were injured, and damage was estimated at $400,000. It was theorized that the arsonist was a sailor who did not want to go back to sea and was trying to delay the *Kennedy's* Mediterranean cruise scheduled for the late fall.

Malicious Mischief. Of the juveniles analyzed in a study of arson by Robbins[9] 80 percent set fires to relieve boredom or as a general protest against authority.

Threat to Nuclear Programs. Arson for revenge against nuclear plants or personnel might be used by people—particularly employees—who perceive themselves to have been hurt or endangered by the plants.

Without a guarded perimeter, nuclear plants could suffer vandalism fires by juveniles who do not fully appreciate the danger involved, or firesetting by excitement seekers (sober or intoxicated).

Arson might also come into play as a diversionary tactic to conceal another crime, such as the theft of nuclear material.

POLITICAL AND RELIGIOUS MOTIVATIONS FOR ARSON

There is a special relationship between religion and fire. Almost every social unit has its myth about the origin of fire, the most famous (at least in the Western world) being the Greek legend of Prometheus. Prometheus stole fire from Zeus, who had hidden it from men, and carried it to earth concealed in a stalk of fennel. As punishment, Zeus chained Prometheus to a rock on Mount Caucasus, where an eagle tore his liver daily until he was rescued by Hercules.[10]

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[8]*Los Angeles Times,* February 6, 1979.

[9]Edwin Robbins and Lillian Robbins, "Arson with Special Reference to Pyromania," *New York State Journal of Medicine,* March 15, 1967.

[10]Sir James George Frazer, *Myths on the Origin of Fire,* Macmillan and Co., Ltd., London, 1930.

Its mythic associations may have influenced the use of fire to punish, to cleanse, and to purify. Fire is associated also with the myth of the Phoenix, the bird that rises rejuvenated from the ashes of the fire in which he immolates himself every five hundred years. This story may have some interest for millennialists who believe the old order must be destroyed before a new and purified society can be born.

Because of these connotations, it is possible that nuclear arson could prove attractive to demented people or groups of extreme religious fanatics. They might be driven to seek a fiery instrument of extraordinary power because their world view holds that ordinary "earth fire" will not suffice. Their fantasies may be so grandiose that they believe only "sun fire" is suitable for the kind of mission contemplated. An individual may believe he is God's instrument, or a religious fanatic may see society as so corrupt and wicked that it must be incinerated, so that a purified world can be regenerated from the ashes. He may believe that he will survive a nuclear holocaust. Some of the currently proliferating religious groups have reinterpreted the Biblical Armageddon in nuclear terms. Some also have made reference to nuclear weapons in their publications. Of course, the significance of their statements can be evaluated by outsiders in various ways. Presumably the motivation to commit nuclear arson would be found either in an individual whose grasp of reality is seriously impaired or a group (religious, political, or other) whose collective hold on reason has been lost.

The Book of Genesis describes a rain of fire and brimstone from heaven to punish earthly sinners in Sodom and Gomorrah. In 1658, eight years before the fire that wiped out most of medieval London, a writer warned that the city would be destroyed by fire for its wickedness.[11]

Twentieth century political fanatics have used fire as a means of sabotage: to cripple an oil refinery in Trieste (1972); and to destroy 20 million documents in a computer center in Italy (1978). Over time, religious groups have meted out extreme punishment using fire, a choice associated perhaps with the flames of hell as the medium for eternal damnation. Between 1450 and 1750 some 200,000 people in Europe were burned at the stake for heresy, witchcraft, or sorcery.[12] Recently, religious conservatives in Iran burned such symbols of "Western decadence" as movie houses and bars.

Fire has been used as an extreme expression of political or religious commitment: the self-immolation of the monks of Vietnam, for example, or of several Czechs following the Soviet invasion in the late 1960s.

Religious and political fanatics may well consider a nuclear facility an appropriate target for arson: They could view it as a symbol of the "profits before people" attitude that some of them are committed to attack. Religious fanatics might want to punish the blasphemy of people who have invaded the sacred ground of the gods by making "sun fire."

As noted in our earlier discussion of psychotic bombers (Chap. 4), the chances

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[11]Scott, pp. 14-15.

[12]D. O. Topp, "Fire as a Symbol and a Weapon," *Medicine, Science, and the Law*, Vol. 13, No. 2, 1973, pp. 79-86, quoting from a study by R. H. Robbins, *The Encyclopedia of Witchcraft and Demonology*, Peter Nevill, London, 1959.

that such irrational adversaries could muster the technical and organizational skills to carry out a scheme of nuclear destruction seem slim but not nonexistent.

Chapter 7
ANALYSIS OF MASS MURDER

At the extreme end of the spectrum of possible nuclear crimes is the potential for radioactive dispersal or a nuclear explosion designed to cause massive casualties and destruction. Fortunately, no such crime has occurred to date, but we cannot dismiss the possibility of such an event in the future. To provide some insight into what might inspire potential adversaries to commit such an act—be they terrorists, fanatical cultists, or psychotics—this chapter examines the phenomenon of mass murder. Our review of humanity's limited experience with deliberate mass murder (outside of war) provides a framework for exploring possible motives for a nuclear mass murder scheme. Particular attention is given to the apparent constraints that have thus far prevented terrorists from engaging in such nuclear destruction, and possible circumstances that might at some point erode these constraints.

As discussed in Chap. 2, some observers fear that terrorists may escalate their acts of violence to recapture the lurid publicity surrounding their past deeds, which faded as those deeds became commonplace, and to recover their leverage over governments that have become increasingly resistant to their demands. It is reasoned that terrorists will kill or threaten to kill larger numbers of people, perhaps resorting to mass murder with chemical, biological, or even nuclear weapons. The desire to acquire such a capability, then, must be considered as a possible motivation for criminal actions against both civilian and military nuclear facilities.

There being no precise definition of "mass murder," we arbitrarily apply the term here to the attempt of an individual or small group of conspirators to kill or threaten to kill a large number of persons in a single action or closely coordinated operation. We therefore exclude series of separate murders such as those committed by Jack the Ripper, the Boston Strangler, the Zodiac Killer, the Hillside Strangler, and the Son of Sam. Genocide, the government-sanctioned, systematic destruction of a racial, political, or cultural group, also is beyond the scope of this inquiry. We likewise exclude, for the most part, acts during and as part of war. (We do not, of course, accept the common assertion by terrorists that they are at war and that their actions therefore constitute legitimate acts of warfare.) These exclusions leave a biased sample of perpetrators: We set aside national governments and their armies, leaving terrorists, large-scale criminal extortionists, and the mentally disturbed.

There is no numerical definition of mass murder. Initially, we imposed an arbitrary criterion of 100 or more deaths, but even going back a half century, only a handful of incidents met this criterion: a 1921 bombing in Bessarabia, a 1925 bombing in the Sofia cathedral, the 1946 bombing of the King David Hotel in Jerusalem, and the 1977 crash of a hijacked Malaysian airliner. Dropping the criterion to 50 or more added another ten or so incidents. To get a list of sufficient length to examine, it was necessary to drop the criterion to around 25, and even then it was necessary to include some unsuccessful attempts in order to examine a range of motivations, intentions, and methods.

The very paucity of incidents argues that mass murders, outside of war and

genocide, are rare. Of course, it could be that our search was incomplete, owing to the difficulty of assembling such a list, largely from press accounts. Because such events are likely to receive widespread news coverage, however, we are confident that we have collected a fair portion of the universe of incidents in which 50 or more persons were killed; and this suggests a universe of some 15 to 20 incidents over a 79-year period.

The fact that most of these have occurred since 1961, and almost half within the last ten years, suggests several hypotheses. The first is that the incidence of mass murder is increasing. The second possibility is that this chronological distribution reflects the data-gathering problem, since we are far more likely to identify incidents in the recent past and to miss incidents in earlier decades. A third hypothesis, consistent with and providing a possible explanation for the first, is that mass murder has been made easier by the development of more concealable explosives and the expansion of commercial aviation. Most of the recent heavy-casualty incidents involved bombs aboard aircraft.

Even allowing for incomplete reporting, the paucity of such incidents leads to one of two hypotheses: Either it is extremely difficult from the technical standpoint to kill a large number of people, or there have been few attempts to do so. The latter hypothesis in turn suggests moral, political, or other constraints beyond the purely technical ones. Putting aside the schemes of genuine psychotics for a moment, such constraints do seem to exist. Thus far, terrorists, for the most part, have achieved their tactical goals without killing or threatening to kill large numbers of people. Most incidents of international terrorism are token acts of violence: small bombs planted outside government buildings, diplomatic missions, or corporate headquarters, hijackings without casualties, or other acts that do not result in any deaths.[1]

Local contests are sometimes more bloody, but a survey of politically motivated violence in places like Argentina, Northern Ireland, and Italy shows little evidence that high levels of terrorism produce high numbers of casualties.[2]

Some recent large-scale incidents involving deaths include the following: 73 persons died in the 1976 crash of a Cubana Airliner jet that had been sabotaged by anti-Castro emigrés; 88 persons died in the 1974 crash of a TWA airliner for which Palestinians claimed credit; 160 persons died in the 1978 bombing of an apartment building in Beirut; again in 1978, a deliberately set fire in a theater in Iran (allegedly by Moslem fanatics) killed over 400 persons; and guerrillas in Rhodesia, using heat-seeking missiles, shot down two civilian airliners in that country, killing a total of 106 persons.

These incidents demonstrate that conventional explosives and fire suffice to

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[1]Of 1166 incidents of *international* terrorism (in which terrorists crossed national frontiers to carry out their attacks, selected foreigners as targets, or interrupted international lines of commerce, as in hijackings) that occurred between 1968 and December 1978, only 234 (or 20 percent) involved one or more deaths. Of the 234 incidents in which one or more persons were killed, more than half involved one death; 38 involved two deaths. Approximately 23 of the incidents with deaths, or about 2 percent of the total number of incidents, involved 10 or more deaths.

[2]Of 5529 acts of terrorism (both *international* and *domestic*) between 1970 and 1978, a total of 854 (or 15 percent) involved one or more deaths. Of the 854 incidents in which one or more persons were killed, 563 (66 percent) involved one death; 85 percent involved three or fewer deaths; 48 incidents (less than 6 percent of the total number of incidents with deaths, and less than 1 percent of the total number of terrorist incidents) involved 10 or more deaths. These figures suggest a slight escalatory trend, however. Of those 48 incidents between 1970 and 1978 involving 10 or more deaths, 40 occurred in the five-year period since 1974, and half since 1976; 14 of them occurred in 1978.

commit mass murder. They suggest that terrorist groups wanting to kill still larger numbers of people can do so without resorting to exotic weapons or higher technology. The inference is that self-imposed constraints have thus far caused terrorists to refrain from large-scale, indiscriminate murder.

With very little direct access to first-hand accounts of terrorist decisionmaking, we cannot be sure what these constraints are. Some reasonable inferences are possible, however, on the basis of limited evidence. To begin with, mass murder is not of itself an objective of terrorism. "Kill one to educate many" is the terrorist dictum; or, as Jenkins has noted elsewhere, "Terrorists want a lot of people watching, not a lot of people dead."[2]

Moreover, terrorists may find it unnecessary to kill a great many people so long as the effect of repeatedly killing a few suffices for their purpose. The Irish Republican Army, for example, is thought by close observers to be content with continuing their bombing campaign, which imposes a tremendous economic burden on the United Kingdom, and regularly killing British soldiers—there are two or three funerals a month in England—until mounting popular pressure compels the British government to name a withdrawal date.

Terrorists are not necessarily amoral, either. They may decide on moral grounds that it is not right to kill "little people" who are not their enemies. In the underground interview cited earlier, Hans-Joachim Klein, a German ex-terrorist, opposed the threat by West German terrorists to blow up three Lufthansa airliners in retaliation for the suicide of three of their members in prison, on the grounds that those who would be killed would be "some little people, in any event, not rich guys."

A further constraint may be the terrorists' desire to appear as a government, and hence to maintain the pretension of legality. Their self-proclaimed status is that of a belligerent power fighting against the state. Their fighting organizations are often called armies or brigades. Terrorist groups use legal jargon to describe their actions: A bank robbery, in terrorist documents, is an "expropriation"; their kidnap victims are held in "people's prisons," tried in a "people's court," and "executed," which is defined in English dictionaries as a legal taking of life. Wanton murder could undermine the image of legitimacy to which they aspire.

Terrorists also might fear that an act of mass murder might alienate their perceived constituents. Most terrorist groups have very few constituents, but invariably imagine themselves to have legions of supporters or potential supporters. It is to this audience that most terrorist manifestos and bulletins are directed. An act of mass murder could frighten off potential supporters or alienate existing ones.

Beyond their perceived constituents, terrorists may worry about a wider audience. They want to shock people, but not necessarily provoke widespread public revulsion. This consideration would weigh more heavily in terrorist organizations operating in their own country as opposed to those operating abroad. Provoking widespread revulsion in Israel probably does not constrain Palestinian terrorists. However, even in the case of transnational operations, terrorists might have to consider world public opinion. Fears of alienating potential supporters and provoking public backlash are related to the more practical fear of unleashing a harsh

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[2]Brian Jenkins, *Will Terrorists Go Nuclear?* California Seminar on Arms Control and Foreign Policy, Discussion Paper No. 64, October 1975.

crackdown that will have popular support. One can imagine that, faced with a credible threat or the fact of mass murder, police powers would be greatly increased, probably with public support.

Terrorists may also be constrained by fears of covert retribution by intelligence services. The fear that the Soviet KGB will track down and kill any terrorists who attack targets within the Soviet Union or Soviets abroad is sometimes offered as partial explanation for the scarcity of terrorist actions directed against the Soviet Union. In Italy, the Red Brigades are said to avoid actions that might provoke intervention by the CIA and other Western intelligence services. Spy movies, along with recent revelations and allegations concerning the agency's activities, form their impression of the CIA as omnipresent, omnipotent, unbridled by any legal restraint. It is difficult to say how much of a constraint this may be. Palestinian terrorism was not abated by Israel's demonstrated willingness to track down and kill Arabs suspected of complicity. On the other hand, an incident or threat of mass murder, as in the case of police powers, would be very likely to intensify intelligence operations and might alter the rules under which the intelligence organizations normally operate.

For all the above reasons, a mass murder plot, which is likely to raise moral issues and arguments about political utility, would provoke debate and dissension within a terrorist organization. This in itself could constitute a constraint, as it exposes the operation and the organization to potential betrayal. Recall Klein's threat to "tell everything" if his former German terrorist comrades blew up the Lufthansa planes.

In sum, the possible self-imposed constraints within terrorist groups against large-scale indiscriminate violence include the following: It is contrary to the principle of terrorism; it is unnecessary to the terrorists' goals; it is considered immoral to kill "little people" who are not the terrorists' enemy; terrorists desire to appear legal; terrorists fear alienating perceived constituents; terrorists fear provoking widespread revulsion; terrorists fear harsh crackdowns that will enjoy popular support from a directly threatened population; terrorists fear retribution by intelligence organizations perceived as powerful and unhindered by the same legal constraints that normally limit police activities; terrorists fear that such operations, for the preceding reasons, will provoke dissension and debate within the terrorists' organization and, as a result, expose the operation and the organization to betrayal.

Under certain conditions, however, the self-imposed constraints of a terrorist group might break down. Struggles in which the terrorists' foes (or intended victims in any large-scale incident) belong to a clearly identifiable and different ethnic group may enable the terrorists to view "them" as not meriting normal considerations of humanity. Palestinian terrorists appear to have few compunctions about killing Jews—men, women, and children; they would undoubtedly argue that Israeli retaliatory raids show similar disregard for the lives of Arab noncombatants. Moslems and Christians freely slaughtered each other during the civil war in Lebanon. IRA bombings of targets in England and, on a smaller scale, the random killings of Catholics by Protestant extremists in Northern Ireland reveal a callousness characteristic of sectarian violence.

In some cases, members of one economic class may deny the humanity of another, and declare it fair game for slaughter. Some early anarchist bombers came close to treating the bourgeois this way. The members of the Chernoe Znamia (the

Black Banner), a particularly violent anarchist group in Russia, "needed no special provocation to throw a bomb into a theater or restaurant; it was enough to know that only prosperous citizens could congregate in such places."[3]

For the most part, terrorist groups are motivated by political ideology or grievances related to the status of their particular ethnic group, although sometimes these may be connected with religious beliefs, as in the case of the IRA and Protestant extremists in Northern Ireland, or Moslem fundamentalist fanatics in Iran.

Throughout history, religious fanaticism has led to the cruel punishment and sometimes wholesale extermination of heretics, heathens, and infidels. Religious beliefs may permit further devaluation of potential human victims. Religious fanatics who believe they have the sanction of God may put no bounds on their violence. They may also believe that, as God's chosen ones, they will survive any doomsday that they scheme or initiate; or they may be willing to sacrifice themselves. The Iranian theater fire mentioned earlier illustrates large-scale violence in the name of religious beliefs. (Reportedly, all of Iran's ayatollahs condemned it, except for the Ayatollah Khomeini, who remained silent on the incident.) The mass suicide and murder by persuasion of members of the People's Temple in Guyana provides another example.

A prolonged struggle may brutalize terrorists, eroding constraints against higher levels of violence. Terrorists do not invariably become more violent with the passage of time, but there does seem to be a general escalation. The early incidents of arson at a Frankfurt department store seem almost innocent compared with the later killings of Buback, Ponto, and Schleyer carried out by German terrorists. In Italy, the Red Brigades have proceeded from comparatively minor acts of violence to maimings and murder. Similar escalations of violence can be seen in the tactical evolution of other terrorist groups.

Several factors may be at work. The capabilities of a terrorist group increase over time: The bombs get bigger and better. The composition and character of the group's members also change over time. Arrests, deaths, and desertions reduce the group; only the hard core remain. New recruits may be a different sort from the original membership. Once a group takes up arms and claims credit for its acts—in other words, emerges as a terrorist group—it attracts new elements, often those who are motivated more by the prospect of violent action than by the fervor of their ideological commitment. Inevitably, the group will attract some common thugs and psychopaths. We cannot be certain, but operationally, this shift in composition may mean that the group is less likely to be constrained by the political considerations that led to and justified the use of violence in the first place. Those in a group to satisfy criminal ambitions or aberrant psychological drives are more likely to favor continued violence, perhaps increased ruthlessness, regardless of how the terrorists' campaign seems to be going. Less violent members may simply quit or be coerced into going along with schemes they oppose to preserve their leadership.

Alternatively, the "hotheads" may break away to form their own more extreme group, or the original leaders may deliberately create a new group to attract the most extreme elements, still keeping them under their control but denying responsibility for their more extreme operations. Whether the Black September organiza-

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[3]Paul Avrich, *The Russian Anarchist*, Princeton University Press, Princeton, New Jersey, 1967, p. 48.

tion was created because Al Fatah's leadership perceived there to be a strategic requirement for a more extreme group, or as a result of tensions within the parent organization, is not clear. Black September may nonetheless have served the dual purpose of containing and directing the firebrands.

The erosion of command authority that results from change in the composition of a terrorist group's membership does not mean that the group's capacity for violence must increase. Declining discipline probably also means a decline in organization and thus in the group's capabilities for efficient operations. If so, then just as its members may become more willing to execute large-scale acts of destruction, they may lose their capability to do so. Instead of escalation, one might see an outburst of undirected, ruthless, but low-level actions, which may presage the group's imminent fragmentation and demise. Finally, a protracted terrorist struggle may also numb the public, compelling the terrorists to commit greater acts of violence to create the intended effects and further eroding constraints.

In sum, the conditions or circumstances that would serve to erode constraints against large-scale indiscriminate violence include: the ability to devalue potential victims by virtue of their membership in a different ethnic group or, in some cases, economic class; the sanction of a divine agent in a group where religion is a powerful motivating force; a prolonged struggle that brutalizes the terrorists and desensitizes the public to lesser acts of violence; the loss of comrades; the perception by the terrorists that current tactics are not working and will not work; the perception by the terrorists that their cause is hopeless or lost; and possession of or access to a mass murder capability, which itself may provide an argument for its use.

Should these circumstances coalesce in such a way as to lead a terrorist group to seriously contemplate a mass murder scheme, several means are open to them. The most common terrorist weapon is the conventional explosive device. To produce heavy casualties, the device must be detonated in a heavy traffic area (bus depot or hotel lobby), must be of considerable size (a car or truck loaded with explosives), or must kill by indirect effects (a small bomb that derails a passenger train or causes an airliner to crash). Terrorists have done all three.

An alternative would be the use of man-portable, precision-guided weapons (hand-held, surface-to-air missiles) such as the Soviet Strela or American Redeye, to shoot down civilian aircraft. Such weapons are increasingly available and relatively easy to operate, and have already been used by guerrillas in Rhodesia. The world's reaction to the shooting down of two airliners in Rhodesia was muted. If a European, American, Japanese, or Israeli airliner were shot down, however, the impact probably would be enormous.

With a few minor exceptions, terrorists have not resorted to chemical or biological weapons, nor have they attempted to use nuclear weapons. The use of chemical, biological, or nuclear weapons by terrorists to threaten or cause mass casualties would represent a major escalation. From a technical standpoint, chemical and biological weapons would be easier to employ. For psychological and political reasons, however, a nuclear capability might be more desirable from the terrorists' point of view. As discussed in Chap. 2, a nuclear capability would endow a terrorist group with unprecedented coercive power. Moreover, it might be perceived as constituting entree into the ranks of the world's major powers. For a disenfranchised terrorist group waging a struggle for political legitimacy, this could represent the ultimate achievement.

In closing, it should be emphasized that the constraints against mass murder that we have identified for political terrorists presumably do not apply to psychotics. Indeed, most past schemes of mass murder have been the products of authentic lunatics. Their objectives have ranged from simple homicide—a man placed a bomb aboard an airliner to kill his mother, incidentally killing 43 other persons—to modes of suicide that would entail the death of many others. In some cases, the objectives have been bizarre. Two teenagers in Chicago planned to poison the city's water supply with typhoid germs, after having innoculated themselves against the disease, as part of a program to start a new master race. Considering that nuclear programs have already aroused bizarre notions and behavior (as evidenced in a recent attempted suicide by self-inflicted radiation), it is conceivable that psychotics could see in nuclear programs opportunities to commit mass murder on an unprecedented scale.

Chapter 8

REVIEW OF NUCLEAR INCIDENTS DATA BASE

NUCLEAR INCIDENTS TO DATE

In Chaps. 2, 3, and 4 we examined three broad categories of potential motivations for nuclear crimes: ideological, economic, and personal. In each case, we used evidence from analogous nonnuclear crimes to explore the mindsets of potential nuclear adversaries and, wherever possible, we discussed actual nuclear-related crimes that seemed to reflect the particular category of motivation being considered. In this chapter, at the risk of repeating some material, we review the nuclear incidents data base taken as a whole to see what conclusions can be drawn from the thus far limited historical record about the apparent motivations behind nuclear crimes. This chapter also addresses, in its final portion, the motivations for a type of nuclear incident that has not been covered in the earlier chapters, namely, threats involving claimed possession of special nuclear material, a nuclear weapon, or an improvised nuclear device.

We compiled our data base from four sources: (1) data on incidents at unlicensed nuclear facilities in the United States, obtained from the Department of Energy, Internal Security Branch of the Office of Safeguards and Security; (2) data on incidents at licensed nuclear facilities in the United States, obtained from the Nuclear Regulatory Commission, Technical Planning and Information Branch; (3) information on U.S. incidents from various press reports; (4) data on incidents involving nuclear programs abroad compiled by Rand personnel from both U.S. and foreign press accounts. The U.S. data base covers over 400 incidents dating from January 1969, 350 of which consisted of telephoned bomb threats to nuclear facilities.

Although relatively few of these nuclear incidents have posed dangers to the general public, the incidents that have occurred in the United States and abroad encompass most of the types we have postulated in earlier chapters: vandalism; token symbolic sabotage; low-level sabotage intended to temporarily halt operations; more serious incidents of sabotage (damage to stored fuel rods by two control room trainees at the Virginia Electric and Power Company plant at Surry, Virginia); pilferage of nonnuclear material from nuclear facilities; theft of low-enriched nuclear material (uranium oxide from the Wilmington, N.C. plant); possible but unverified diversion of large quantities of SNM (NUMEC); low-level standoff attack—rifle fire; armed assault (a Basque separatist attack on the nuclear power plant at Lemoniz, Spain); threats against facility personnel (death threats against president of Iberduero, the company building nuclear power plants in Spain); armed occupation of a facility (by the People's Revolutionary Army at a nuclear power plant construction site in Atucha, Argentina); hoax bomb threats against nuclear facilities; hoax nuclear threats; and hoax sale of SNM.

No incident of sabotage to date has led to a radioactive release. There have been no high-level standoff attacks on nuclear facilities using crew-served weapons; no

individual or subnational group has fabricated a nuclear device, nor has anyone attempted to do so as far as we know.

We have seen arson and sabotage; theft, smuggling, and the attempted sale of nuclear material; offers of bribes, extortion, and political blackmail; intrusions, armed assault, and threatened murder. Theft and sabotage have occurred at uranium mines and milling facilities (in the United States, India, France); at nuclear power plants in operation and under construction; at fuel fabrication facilities; at research facilities; and during transport. In sum, the actions postulated earlier in this report, except for some of the most serious ones, are by no means hypothetical.

Uranium has been stolen, transported across state lines, smuggled internationally, and offered for sale through intermediaries. We know of no black market for nuclear materials, however.

We have also seen almost every category of perpetrator: hostile employees; political extremists; zealous environmentalists; foes of civilian and military nuclear programs; common thieves; pranksters; and psychotics. They have operated individually or as groups (in the case of theft and armed assault and probably in some of the incidents of sabotage), although we know of no internal conspiracies to steal nuclear material or seriously sabotage nuclear facilties.

Almost every motive we have discussed in this report is present in the incidents to date: economic gain; opposition to nuclear programs; political beliefs (as in the case of terrorists); revenge; suicide; psychosis; self-aggrandizement (as in the case of guards creating incidents in which to play the hero); and mere proof that a particular action could be done (e.g., penetrating a fence and gaining access to the reactor area).

Nuclear programs seem to have all of the adversaries that a large chemical company might face (e.g., disgruntled employees, extreme environmentalists) and that any industry dealing in a very valuable commodity (e.g., uranium) might face; nuclear programs also have a unique set of adversaries in the antinuclear ranks; and finally, because of their unique qualities and history, nuclear programs also seem to have a moth-and-flame attraction for people with certain pathological problems marked by bizarre behavior.

Employees, who appear to account for most of the telephoned bomb threats received by nuclear facilities and probably many of the incidents of low-level sabotage, have the two major advantages of knowledge of and legitimate access to facilities. They also may be able to conceal their crimes. (Because of their familiarity with nuclear facilities and material, however, they may never even consider certain actions that seem predicated on unwarranted expectations or fears of nuclear facilities or nuclear material—for example, some of the more bizarre nuclear hoaxes.) Security guards could cause problems because they may have access to all or most parts of a nuclear facility and have legitimate excuses for being there, they know the security and safeguard measures in effect, and they are armed. They could funnel information to adversaries or collaborate in a hostile action by neutralizing security measures. To date, members of the guard force have been involved in a few low-level incidents (apparently out of boredom or efforts to hold onto jobs or advance their careers); there are no known cases, however, of their having participated in any of the more serious incidents of sabotage or theft.

NUCLEAR THREAT MESSAGES[1]

Between October 1970 and November 1977, there were 49 incidents in the United States involving threat messages in which adversaries claimed to possess nuclear material or a nuclear device and threatened to wreak severe damage with it. In January 1979, the press reported another such incident. In only one of these cases did the author actually have any nuclear material (low-enriched uranium oxide); authors of the other 49 messages were perpetrating hoaxes. But hoaxes or not, all these incidents were criminal violations of the Atomic Energy Act or other federal or state laws; the authors of these threat messages can therefore be classified as nuclear adversaries, albeit at the low end of the spectrum of malevolence. This section examines their apparent motives.

The authors of nuclear threat messages represent a group of people who have thought about the use of nuclear energy as a coercive or destructive force in a variety of ways. By studying this group, we may develop a better understanding of the motives and intentions of those who may be inclined to take criminal action against nuclear facilities and programs. In addition, the patterns of their concerns, thinking, and actions may provide insights into what other nuclear adversaries might consider or attempt in the future. Such insights could be useful in the development of deterrents and security measures to protect nuclear facilities and programs.

Of the 50 threat messages studied, 35 were extortion threats in which the author threatened to use special nuclear material (in the form of a nuclear explosive or dispersal device) unless certain demands were met. The other 15 messages made no demands, but simply stated that nuclear material would be exploded or dispersed; we might term these "nuclear warnings." As indicated above, one of the extortion messages, issued by an adversary who did in fact possess nuclear material, can be classified as a genuine threat. The remaining 49 threat messages have all been classified as hoaxes.

The single genuine threat was the case described in Chap. 3 of the temporary employee at the General Electric Fuel Processing Plant who stole two five-gallon drums of low-enriched uranium oxide and demanded $100,000 for their return. He threatened, if the ransom were not paid, to embarrass the plant manager and the company by exposing the lax security measures that allowed the theft to take place and, if authorities were notified, to disperse the radioactive material in a densely populated area. As noted earlier, his motivation appears to have been financial gain combined with a desire for revenge against the plant manager and the company for what he perceived as a premature termination.

Classes of Hoax Threats

We have analyzed the 50 nuclear threat messages on the basis of concepts derived from psychology and psychiatry. We hypothesize that a hoax threat can serve various purposes for adversaries, and have accordingly divided the 49 hoaxes

[1]This analysis is based on a summary listing of 49 nuclear threat incidents released by the Department of Energy in May 1978. Information regarding one additional incident, which occurred in January 1979, was obtained from newspaper accounts.

into three classes: expressive, disruptive, and "con" hoaxes. On the basis of information in the threat messages and information on 15 of the authors who have been identified, we have also developed a typology of adversary types: psychotic, sociopathic, adolescent, and cause-inspired. In the following pages, we explain these categories of hoaxes and adversaries and present a matrix reflecting the distribution of the analyzed threats among these categories.

In an *expressive hoax*, the author is apparently satisfied merely by making a threat to someone in authority, perhaps to express his concern about a particular matter.

In a *disruptive hoax*, the author seems bent on seriously disrupting his victim's routine, commonly by forcing the victim to spend a great deal of time and resources in responding to the threat before finally dismissing it as a hoax. In a disruptive hoax, the perpetrator has no intention of actually following up on his demands.

In a *con hoax*, the author intends to see that his demands are met, and will try to bluff the victim into compliance by making his threat as convincing as possible.

Typology of Hoax Authors

Our analysis suggests that four types of adversaries have been encountered thus far: psychotic, sociopathic, adolescent, and cause-inspired.

The messages composed by *psychotic* adversaries clearly reveal disturbed thinking. They are variously disorganized, confused, irrational, grandiose, persecutory, bizarre, and primitive, and often irrelevant to current events and situations. The authors are goaded by inner tumult, not external reality.

In threats from *sociopathic* adversaries, antisocial concerns form the underlying theme. Personality traits revealed in their threats show them to be variously manipulative, coercive, demanding, hostile, passive-aggressive, guilt-inducing, responsibility-avoiding. A dominant motive is personal gain: either money or the exercise of power. The threat situations they devise often have a mechanism or requirement for communication with the victim. Or, there may be a series of demands that require serial compliance by the victim, or escalated demands with threats of punitive action at any stage where compliance is not forthcoming. Such adversaries tend to overestimate their own capabilities.

Adolescents have transmitted a number of threat messages. Such individuals are characterized by immaturity, defiance of authority, and a fascination for engaging authority in conflict, especially if they perceive little personal risk in doing so. For classification purposes, we include young people up through high school age in this category. Some of the personality characteristics reflected in their messages are: hostility, manipulation, control, dependency, responsibility-avoidance, and fascination with power.

The *cause-inspired* adversary is motivated basically by a political or social cause. He has escalated his threat to the nuclear level in an attempt to force compliance with demands that would advance the cause. His threats tend to be: issue- or cause-related, reality-oriented, purposeful, directed. They may include a rationale justifying the threatened act, which may be associated with a history of prior acts in support of this cause. Nuclear coercion is seen as the next and possibly the ultimate form of leverage to gain his objectives. The author may espouse

peculiar values or a "far-out" political philosophy, but does not demonstrate disturbed or psychotic thinking.

Table 1 summarizes the nuclear threat messages by class of threat and type of adversary.

Table 1

CLASSIFICATION OF 50 NUCLEAR THREAT MESSAGES

Type of Adversary	Class of Threat				
	Expressive Hoax	Disruptive Hoax	Con Hoax	Genuine Threat	Total
Psychotic	25	6	0	0	31
Sociopathic	0	3	2	1	6
Adolescent	2	2	1	0	5
Cause-inspired	4	0	0	0	4
Total	31	11	3	1	46

NOTE: Four additional threat messages are not accounted for here. Two of these were expressive hoaxes and one was a disruptive hoax, for which the types of adversary could not be identified. The fourth message could not be classified by type of threat.

Two further points are worth noting. First, all three of the con hoax threats—those that appear to be the best thought out and most fully elaborated—appear to have been motivated by financial gain. All three made monetary demands (ranging from $500 thousand to $2.5 million).

Secondly, there appears to be a recent trend toward greater concern with specifically nuclear-related issues in the threat messages. Prior to 1976, 4 nuclear threat messages (out of a total of 30) included substantive demands related to nuclear issues. From January 1976 through January 1979, 8 out of a total of 20 nuclear threat messages related to nuclear issues, chiefly expressing sentiments against nuclear weapons and nuclear power. Given increasing controversy and public debate surrounding nuclear energy (see the discussion in Chap. 9), continued prominence of these themes in future nuclear threat messages would not be surprising.

The insights we have gained into the motivations and personality characteristics of authors of nuclear threat messages have value in their own right, because they help us to understand and respond to one type of low-level nuclear adversary. An important related issue is the potential relevance of these findings to higher-level nuclear crimes. Would authors of such messages escalate to more serious nuclear acts if they were able to acquire a nuclear capability easily? Will perpetrators of nuclear actions—more serious than nuclear threats—come from a population with similar characteristics to those of people who make threats?

At this time we cannot say with confidence whether people who have made hoax threats would make or carry out genuine threats if they somehow acquired a nuclear capability. Expressive hoaxers are likely to remain content with venting their feelings by making threats. Con hoaxers are another matter. Bogus though their nuclear threats may have been, they apparently were serious about having their extortion demands met. They might well redouble the pressure if they acquired a real nuclear capability, and some of them might stop at nothing to gain

compliance with their demands. As we gain experience with this class of hoaxer, we may be able to identify the behavioral patterns and characteristics that can distinguish the perpetrator of a serious nuclear act from one who might initiate a hoax or less serious nuclear act.

Some types of adversaries typically lack the motivation, intention, or psychological equipment to undertake a complex or sustained nuclear action. The dysfunctional psychotic could not organize or direct his personal resources sufficiently to carry out a nuclear act. The adolescent, however, may engage in acts that have serious, unintended consequences. Most adolescents can be expected to "outgrow" this sort of behavior, but some may not; and an intelligent although warped young person emerging into adulthood could constitute a hazard—perhaps by trying to show the establishment that he can design or possibly even construct a workable nuclear device using a substitute for the necessary special nuclear material.

To date, nuclear threats appear to have come from individuals acting alone. While it is doubtful that some types of adversaries, such as the dysfunctional psychotic, would become part of an adversary team, it is possible that individuals with a common intention may form a group and undertake illegal and malevolent nuclear actions, whether for economic or political motivations. Such a group might also form under the leadership of a charismatic functional psychotic. Although not nuclear-related, the behavior of Charles Manson and his followers illustrates how a mentally disturbed, but functional, person can attract a band of zealous followers and incite them to bizarre acts of murder. The Jonestown mass murder-suicide is another example of a group under the sway of a leader whose personal grasp of reality was tenuous, yet whose delusional beliefs became the basis for a mass, certainly antisocial, action.

We still do not thoroughly understand, however, the psychological processes that would lead either individuals or groups to contemplate and perhaps attempt to acquire a capability for nuclear destruction. The further study of nuclear threat messages and their authors may provide some clues that will assist in the design of deterrents and security systems for nuclear material and weapons.

Chapter 9
THE CLIMATE FOR POTENTIAL MALEVOLENT ACTIONS: CHANGING PERCEPTIONS OF NUCLEAR PROGRAMS

The final section of an earlier Rand report addressed the dynamic nature of the threat against nuclear programs and identified "a continuing requirement for monitoring and reassessing the potential threat as it changes over time."[1]

In the two years since that report was published, several serious nuclear incidents have occurred and one worrisome situation has come to light. Belated controversy arose over some 200 pounds of U-235 unaccounted for at the NUMEC nuclear fuel processing plant during the 1960s.[2] There was unconfirmed speculation that the material might have been diverted to Israel for use in bomb construction. The first genuine nuclear extortion threat occurred in January 1979, involving low-grade enriched uranium stolen from a General Electric fuel processing plant. The perpetrator was quickly apprehended, and there would have been little genuine hazard to public safety anyway, given the limited radioactivity of the material stolen; nonetheless, this represents a first and clear escalation, in contrast to the hoaxes of the past. A third dramatic incident was the skillful sabotage in France of nuclear reactor parts intended for Iraq. The saboteurs have not been identified, but their efforts seem to reflect a new level of sophistication in nuclear sabotage.

These incidents at least suggest a trend toward more serious malevolent actions involving nuclear programs; but in attempting to chart the dynamic nature of such a trend, our scope of inquiry should go beyond the incidents themselves to include social conditions that might provide or enhance motivations to commit such crimes. In particular, this chapter explores the possibility that American public attitudes about nuclear matters may generate a climate more conducive to malevolent actions.

Our current understanding of potential criminal adversaries of U.S. nuclear programs suggests that their actions may be driven by motivations that are directly antinuclear—designed to discredit, disrupt, or undermine nuclear programs, civilian or military—or that they may select nuclear targets to satisfy other types of motivations. (For example, in a theft of special nuclear material for ransom or sale, the motivation would be economic gain.) For the former type of adversary, it seems reasonable to assume that his motivations, plans, and actions may be affected by the context surrounding nuclear-related issues. This context includes media coverage of nuclear stories, fictional treatment of nuclear topics in novels, movies, and television, and public opinion on nuclear issues.

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[1]Peter deLeon et al., *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs*, The Rand Corporation, R-2225-SL, February 1978, p. 61.

[2]John J. Davidson, *Safeguards Summary Event List*, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, NUREG-0525, May 1979.

We hypothesize that widespread coverage of negative aspects of nuclear phenomena may increase the likelihood of criminal actions hostile to nuclear facilities. Such coverage could have a direct stimulating effect by increasing a potential adversary's perception of nuclear dangers and the urgency of action; or it could have an indirect effect, by convincing a potential adversary that the public (his presumed constituency) would condone antinuclear actions, or would at least respond with appropriate panic to a sensational coup by the adversary. However, our limited understanding of decisionmaking within adversary groups, and the time lag between the will and the deed, make it difficult to draw a one-to-one correspondence between a given event or news item and a subsequent antinuclear action.

In recent months, nuclear-related controversies have been much in the news. Some of the more prominent items have been the following[3]:

- The accident at Three Mile Island received wide publicity (the impact of which is assessed separately in a later section of this chapter).
- Reports that several college students have been able to develop designs for atomic weapons, using nonclassified material, raised the spectre of improvised nuclear devices by criminal or terrorist groups. In a related controversy, the U.S. government sought unsuccessfully to prevent publication of an article containing technical information about the operation of the hydrogen bomb.
- Allegations that nuclear material was diverted from NUMEC to Israel raised concerns about the adequacy of current systems for safeguarding special nuclear material to prevent proliferation.
- Recent governmental reports suggest that the health hazards from exposure to low levels of radiation may be greater than previously thought. There appears to have been an increased incidence of cancer among residents of areas exposed to fallout from atmospheric testing of nuclear weapons (Utah and Nevada) and among soldiers posted close to the test sites. There have also been allegations of abnormally high cancer and leukemia rates among workers at Portsmouth naval shipyard, which tends nuclear submarines. (After charges by critics that the Navy was suppressing information on this problem, Congress assigned a team of federal health specialists and civilian experts to conduct an independent investigation.)[4]
- The $10 million judgment against Kerr-McGee to be paid to the family of Karen Silkwood focused attention on the safety of nuclear plants. (Although the court's decision did not address this aspect of the case, Silkwood supporters allege that her car was forced off the road while she was en route to meet a *New York Times* reporter to supply evidence of safety violations at the Kerr-McGee plant in Oklahoma City.)
- In Denver, half-century-old radium tailing dumps have been found to emit

[3]The items listed here reflect our informal monitoring of various media sources during 1979. A more systematic analysis of television evening news coverage of nuclear energy during the past decade (August 5, 1968—March 27, 1979) suggests a preponderance of negative themes; for example: radioactively polluted environment, cooling loss and meltdown danger, radioactivity and cancer, and terrorism and homemade bombs. See *Television Evening News Covers Nuclear Energy: A Ten Year Perspective*, The Media Institute, Washington, D.C., 1979.

[4]Department of Health, Education, and Welfare, *Interagency Task Force on the Health Effects of Ionizing Radiation: Summary*, Government Printing Office, Washington, D.C., June 14, 1979.

potentially dangerous levels of radioactivity, focusing attention on the issue of radioactive waste disposal.

- The film "The China Syndrome" was released, dealing with the dangers of a possible core meltdown following an accident at a nuclear energy plant. Industry and government officials are depicted as less-than-conscientious guardians of public safety, conspiring to keep the public from being informed about the hazardous situation. There has been considerable discussion of the movie in the press, including reports of conflicting opinions by "experts" concerning the chances that the type of accident portrayed in the movie could actually take place.
- Early in 1979, the Nuclear Regulatory Commission ordered the temporary shutdown of five nuclear power plants because faulty design had presumably left vital cooling systems vulnerable to possible earthquake damage.

CHANGING PERCEPTIONS OF NUCLEAR PROGRAMS IN LIGHT OF RECENT EVENTS

These recent news items and the film create the impression that nuclear programs both incur and cause many more problems (e.g., possible thefts, radiation hazards) than the public has previously known or imagined. As a result, public confidence in reassurances from government and industry that such things could not or would not occur may have begun to erode, and the negative publicity could be used to justify, and may inspire, criminal acts of violence against nuclear programs. Some opponents might even consider it worth inflicting a few casualties in the short run to alert the public to supposedly greater long-term dangers.

It is sometimes alleged that people could be, or have been, harmed by such things as atmospheric testing, unsafe nuclear power plants, and dumping of radioactive material, and that industry and government either did not know how to protect the public from hazards, or were negligent in taking action against hazards, or even conspired to conceal hazards from the public. According to some extreme interpretations, the nuclear industry and government may even have taken criminal action to prevent revelations of deficiencies or hazards, as some allege in the case of Karen Silkwood, and as "The China Syndrome" suggests.

In such an atmosphere, an emotionally disturbed person who works in or near nuclear facilities, and perhaps suffers from a real or imagined health problem or harbors a personal grievance, could perceive a great deal of external support for the notion that nuclear programs were somehow to blame for his problem (for example, that radiation had ruined his health; that he was fired because he knew the plant was unsafe; or that he was the scapegoat for some failure that management wanted to conceal). This could spur him to take action against nuclear facilities. For example, George Metesky, the "Mad Bomber of Manhattan," carried on a 16-year bombing campaign motivated by his belief that an accident at a Consolidated Edison plant had ruined his health and that he had not been appropriately compensated.

The considerable misinformation and confusion about nuclear issues may have various effects on potential adversaries. On the one hand, some may hope to achieve spectacular results that are actually beyond their capabilities. On the other

hand, people may shrink from acting for fear of the consequences—especially personal danger from exposure to nuclear substances.

In Europe, it seems that where nuclear energy programs have expanded rapidly in an atmosphere of intense controversy, there have been violent acts against nuclear facilities, such as bombings, sabotage, and threats against personnel. Zealots with other political axes to grind have also struck at nuclear targets. In Spain and France, the groups claiming responsibility for these actions are at the same time waging a campaign for independence or regional autonomy, and view nuclear programs as a symbol of central government domination and exploitation of their territory. These regional political dynamics are unlikely to occur in the United States, but they illustrate how partisans for different causes can perform the same kinds of actions.

As noted in Chap. 2, if the antinuclear movement follows the historical model of the anti-Vietnam War demonstrations, the experience of demonstrations, confrontations with police, injuries, arrests, and imprisonment may have a radicalizing influence on participants and could inspire further and more extreme acts of violence. It is noteworthy that certain currently active terrorist groups had their origins in the antiwar movement of the 1960s (Japanese Red Army, Red Army Faction, Red Brigades). However, it is not clear how much we can infer from the European experience and apply to the situation in the United States.

Most ideological groups also experience trouble, from time to time, with hotheads among their members, whether zealots or thrill-seekers. As any widely publicized protest movement grows in size, it is likely to attract a few extreme and irrational people who join the movement solely for the sake of adventure, excitement, the appeal of danger, and the opportunity for action. If such individuals attach themselves to the antinuclear movement, they might prove uncontrollable and perpetrate acts of violence not necessarily condoned by others in the movement. The organizational mode of some of the antinuclear groups, which is based on independent, locally organized units, may reduce the ability of the movement's leaders to control the actions of these fringe elements. On the other hand, some members of antinuclear groups see this form of organization as a means of precluding infiltration by outside provocateurs, thereby reducing the potential for violence, at least at demonstrations.

The frustration of failure may also goad otherwise self-restrained people into violence. If other means of halting or limiting nuclear programs (such as public referendums, legal actions, demonstrations) are widely perceived to be failing, it is possible that more extreme criminal actions could ensue. Two bombs detonated in Switzerland, following a referendum that approved the continued development of nuclear energy, provide limited evidence in this regard. As noted earlier, some U.S. antinuclear groups have recently decided to include destruction of property, though not violence against people, among approved tactics for fighting nuclear programs.

NEGATIVE CONNOTATIONS OF NUCLEAR PROGRAMS

As a result of their wartime origins, the way they have been portrayed in novels and movies, and recent negative media coverage, nuclear energy, weapons, and

facilities have taken on many negative connotations, some of which the general public is likely to share. We are not talking here about the concerns expressed in the current debate about civilian or military nuclear programs, but rather the deep anxieties and emotional responses aroused by nuclear energy. Some of these responses are motivated and nurtured by such perceptions as the following:

Some people associate the word "nuclear" with "bomb" and thus with images of terrific destruction: Hiroshima, Nagasaki, *On the Beach,* the end of civilization.

For others, the word "nuclear" evokes images of deadly radiation, an invisible poison that lasts forever and produces a slow death from cancer or genetic defects that persist from generation to generation. Many believe plutonium is deadly to the touch. Such notions recall horror movies of the 1950s with grotesque mutants (giant ants, giant snails, humanoid mushrooms) resulting from atomic radiation.

A nuclear device often figures as the ultimate and inevitable terrorist weapon, as suggested in the following fictional titles: *Ultimatum, Ultimatum PU 94, The Doomsday Contract, Goodbye California.* In such works, nuclear programs cannot be secured against terrorist attack. Any bright lunatic can make an atom bomb. The population will be blackmailed.

For some observers, nuclear programs evoke visions of a fascist state. Program security will inevitably require measures that curtail civil liberties and will ultimately lead to the imposition of a police state. This case is made most forcefully by the German author Robert Jungk in *Der Atomstaat: Vom Fortschritt der Unmenschlichkeit (The Atom State: On the Progress of Inhumanity).*[5]

To the extent that nuclear energy symbolizes the State, capitalism, and centralization, those who challenge current political or economic systems see the nuclear field as an appropriate battleground. In this sense, nuclear programs may have replaced the Vietnam War as a rallying point for critics of the "System."

Nuclear physics and technology are beyond the comprehension of many ordinary people, who may consequently conclude that it is useless for them to try to form any opinions about it. But when they turn to scientists for authoritative judgment, they are further baffled to find that even the experts publicly disagree on many aspects of nuclear programs. (That itself may be a source of anxiety and lead to emotional responses.)

For others, the word "nuclear" conjures up visions of Armageddon, which some religious groups have reinterpreted to mean eventual nuclear holocaust. It is not merely the end of this world but the ultimate punishment for the wicked, the unbelievers.

THE IMPACT OF THREE MILE ISLAND

The accident at the nuclear power station at Three Mile Island focused public attention as never before on the issue of nuclear safety. The question to be explored here is whether and how the Three Mile Island accident might affect the probability of malevolent criminal actions against nuclear programs.

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[5]The publication was dedicated to Eugen Kogon, a survivor of a Nazi concentration camp who subsequently wrote a book entitled *Der SS Staat (The SS State).*

Suspicions of Malevolence and Elaborate Conspiracy Theories

For those who saw the movie "The China Syndrome" and for many who did not, the accident at Three Mile Island may have seemed to be similar (although it was not), thus confirming the credibility of the movie. Does the accident then also suggest or even confirm many people's suspicion that other aspects of the movie are true, for example, the willingness of persons within the nuclear industry to resort to criminal violence—attempted murder—to conceal shortcomings?

It is often difficult to determine whether an event like that at Three Mile Island was indeed an accident or might have been wholly or partly due to sabotage or intentional acts of omission. It was not surprising, therefore, that some were quick to attribute the "accident" to sabotage. Under the headline, "Sabotage by Bizarre Cult Suspected in Three Mile Island Nuclear Crisis," *The National Enquirer*, on May 1, 1979, stated: "The maniacal leader of a bizarre cult and his zombie-like followers are suspected of sabotaging the Three Mile Island atomic power plant and causing the recent headline-making nuclear incident."

As in presidential assassinations, conspiracy fans readily conjured up elaborate plots. Dr. Morris Levitt, Executive Director of the Fusion Energy Foundation, was scheduled to appear at Columbia University to (as the flyer stated) "detail overwhelming evidence that the Three Mile Island nuclear 'accident' was sabotage—designed as part of a no-energy program for the United States," and to report on the "ongoing work of the Blue Ribbon Commission in uncovering the sabotage involved in Three Mile Island, as well as the role of Energy Secretary James Schlesinger and the Federal Emergency Management Agency [FEMA—set up by the Trilateral Commission and other government and private bodies] in spreading panic using the Harrisburg incident in order to implement ZERO-GROWTH ENERGY POLICIES."

Aside from such extreme reactions, popular responses to the Three Mile Island accident could include the following:

Fertile Climate for Redress, Revelation, and Revenge

Nuclear hoaxes may increase and become more context-related (see Chap. 6 for a fuller discussion of hoaxes).

Miscarriages, birth defects, cancer incidents, and other afflictions may in the future be attributed, correctly or incorrectly, to the Three Mile Island accident by people living both near and at a considerable distance from Harrisburg. In other cases there will be anguish on the part of actual and self-perceived victims, perhaps a desire for revenge, and a greater justification for real victims and others to take extreme measures to halt nuclear programs.

One serious consequence may be an increase in "infiltrators" and "defectors" among nuclear program employees. The coincident Karen Silkwood trial and the verdict awarding over $10 million might well encourage "nuclear accidents." (This is in no way meant to imply a judgment or an opinion on the Silkwood case itself or its disposition.) Not only might the contaminated "defector" be acclaimed by certain segments of the population, but he or she also might well anticipate a

multimillion-dollar award for what the Silkwood trial judge described as "invisible injury to bone, tissue and cells."

It is possible that the "defectors" and the "infiltrators" would not be limited to those who see the current situation as a chance to "cash in," but could include "whistle-blowers" with genuine concerns about the safety measures of a particular facility or program.

Increased Opposition to Nuclear Programs and Erosion of Trust in Government and Industry

Because a major incident like that at Three Mile Island focuses the attention of the news media on the subject area, any subsequent incident or suspicion of an incident is likely to receive enormous coverage. Even "routine" mishaps may be treated as front-page events. The result may be to generate an overall impression that nuclear facilities operate at the edge of disaster. This, in turn, may stimulate not only further opposition but also new outbreaks of sabotage and hoaxes.

Whether or not people will believe that "the system" in the nuclear area works or does not work may become a matter of irreconcilable dispute. Obviously, one can argue either that the system does not work because the Three Mile Island accident occurred, or that it does work because the damage was contained.

If, despite possible increased popular resistance, the government is determined to press ahead with nuclear development, the issue could become a domestic Vietnam. As opposition to the Vietnam War inspired criminal violence on the part of a few, so Three Mile Island could inspire sabotage and other criminal actions against nuclear programs.

As for what the future will bring, we do not have the Vietnam analogy to fall back on, because in the Vietnam case the political leadership eventually decided to end American involvement in the war. When that was done, the opposition died down, of course. Because the authorities probably will not abandon nuclear power but will continue to promote and broaden it, we may have an open-ended and intensifying confrontation that could escalate substantially.

Such a confrontation may be all the more likely because so many "cause-seekers," including both those who participated in the antiwar movement and those who were too young to have done so, may seize on nuclear energy as a post-Vietnam issue into which to channel their personal energies and idealism. If they remain resolute, and particularly if they are inflamed by another nuclear incident, the United States may see a virulent split in its citizenry.

Because some segments of the public are convinced that information was withheld during the Three Mile Island accident, rampant rumors repeated by the media may interfere with public order and government control in case of a future accident.

In the public mind, Three Mile Island may have demonstrated that government officials, industry spokesmen, and scientists cannot be trusted to manage a nuclear crisis effectively, nor to report to the public truthfully. Public skepticism might impede government operations in various ways should terrorists actually seize control of a nuclear reactor or threaten to detonate a nuclear device, especially if some spokesmen assure the public that there is no danger, while others—and the

news media may give them prominence—assert that great disaster may result. After Three Mile Island, the public is more likely to believe the doomsayers. Knowing this, potential adversaries may be inspired to undertake such actions.

Searching questions addressed to experts about the long-term effects of the development of nuclear energy may remain unanswerable for years. As a result, antinuclear sentiments may become increasingly popular and respectable, and many who previously were timorous about taking a stand or uncertain about the issues may join the demonstrations. Where local authorities lack special skills in crowd control, there may be an increased possibility of damage to facilities and even the chance of forced entrance and occupation of a facility. There also may be a heightened probability of serious confrontations with the police that may provide a radicalizing experience for the demonstrators.

The seeming perplexity and ineptness of the authorities, as portrayed in media reports, in dealing with a nuclear accident or nuclear matters in general, may in itself provoke increased hostility, resistance, demands for better handling of things, and unlawful attacks on facilities or personnel.

Intensification of Nuclear Debate and Radicalization of Participants

Faced with the great complexity of most important contemporary issues, people tend to resort to vigorous assertions based on their prejudices, in this case polarized more and more into "hardline" and "softline" positions. As Bertrand Russell has observed, "It is an odd fact that subjective certainty is inversely proportional to objective certainty. The less reason a man has to suppose himself in the right, the more vehemently he asserts that there is no doubt whatever that he is exactly right."[6] The Three Mile Island episode therefore may be less likely to stimulate helpful inquiry than it is to solidify people in their preconceived notions. If so, the upshot will be no change in the *proportion* of opposite views, but escalation on both sides, with frequent and intense confrontation the probable result.

The original promise of nuclear energy as a cheap and abundant source of power, already severely damaged in the public mind by escalating costs, may be further vitiated by expectations of still higher costs due to additional accidents, increased security needs, increased technological prevention devices, and the possibility of financial difficulties of reactor operators—all to the detriment of the public.

If Three Mile Island further increases public opposition to nuclear energy in Germany, France, Spain, and other countries, a loose international confederation of antinuclear people may begin to form. There already is evidence of some cooperation among antinuclear elements in Europe and their counterparts in the United States.

In this discussion of the context surrounding nuclear programs, possible negative effects have been stressed because, in our view, they may contribute to a climate that is more conducive to adversary actions against nuclear programs.

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[6]Bertrand Russell, *The Scientific Outlook*, The Free Press, Glencoe, Illinois, n.d., pp. 64-65.

Chapter 10

A MATRIX OF ADVERSARIES, MOTIVATIONS, AND POSSIBLE ACTIONS

This chapter presents a matrix linking the categories of potential adversaries with nuclear-related crimes that appear congruous with their motivations and therefore are plausible. The matrix does *not* pretend, however, to assess the probability of occurrence of any of these crimes, nor does it predict that any of them will occur. Statements about relative likelihood must await completion of the next step in our research: a synthesis of this study's analysis of motivations with analyses of adversary attributes and capabilities.

The nuclear-related crimes covered in the matrix fall into two broad categories: those that directly involve the security of U.S. nuclear facilities or programs, and those that do not. The latter would include, for example, nuclear extortion threats or dispersal of nuclear material not necessarily obtained from a U.S. facility. We have included these because the response to such nuclear threats or actions could involve U.S. nuclear security officials and make special demands on security and safeguards systems. We further subdivide actions directly threatening U.S. nuclear facilities or programs into three categories, depending upon whether the basic intention is to (1) destroy or disable a nuclear facility, (2) acquire nuclear materials, weapons, or classified information, or (3) cause disruption to nuclear progams—either in service of some other goal, e.g., extortion or coercion—or as an end in itself.

The adversary types in the matrix are grouped according to their primary motivations, corresponding to the three-part division discussed earlier: economic, ideological, and personal motivations. A fourth category, "in service of foreign governments," is also included, although the report has not covered it in detail. (Chapter 5 briefly discusses the possibility of nuclear industry employees being foreign agents.) This category includes mercenaries, foreign agents, and foreign commandos.

The matrix is intended to cover the full range of potential nuclear-related crimes as well as the full range of adversary motivations and types. We recognize, of course, the possibility of multiple motivations (e.g., an adversary with both economic and personal motives) as well as of composite actions involving more than one of the nuclear-related crimes listed in the matrix.

In deciding which adversaries would be likely to contemplate particular actions, we based our judgments on the present political and social environment. We realize, however, that changing circumstances could alter the types of actions a given adversary might be willing to attempt. For example, the use or threatened use of nuclear capabilities by terrorists elsewhere in the world, the emergence of a black market in special nuclear material (SNM), the increased polarization of pronuclear and antinuclear elements in society, general political or social unrest,

or the occurrence of a serious nuclear accident could alter the attractiveness of certain crimes to various potential adversaries.

A question mark appears after several of the entries in the matrix to indicate uncertainty as to whether that particular action would in fact be congruous with that adversary's motivations and intentions. Solid bullets indicate crimes that have already been committed.

TYPES OF ADVERSARIES

Professional criminals pursue crime as a career. They are unlikely to be hired by a nuclear facility that requires security clearances, because they are likely to have criminal records that would be picked up in a routine background check. There is some chance of their penetrating a facility if they do not have criminal records, or if they assume false identities, or apply at a facility that does not subject all employees to background investigations or does not bar people with felony records from all jobs.

Occasional or novice criminals may have committed felonies but cannot be considered habitual offenders or professional criminals.

Opportunists are people with no previous involvement in crime who decide to take advantage of windfall opportunities, exemplified by the person who withdraws the ten thousand dollars that has accidentally been credited to his account, or drives off in an armored truck while his fellow guards are in a restaurant having lunch. Lacking a criminal record, the novice criminal or opportunist is far more likely to be an insider than is the professional criminal. An analog that appears in the news from time to time is the perpetrator of computer crimes, typically an insider without a criminal record who takes advantage of his access and unique skills to carry out his exploits.[1] It is not likely, on the whole, that a novice criminal who is an outsider would "go nuclear" in his first crime, with the possible exception of some form of nuclear threat message in connection with extortion.

From the standpoint of security, then, the main difference between the professional criminal and the novice criminal or opportunist is the greater likelihood of the latter's being an insider. It is problematical whether any clearance procedure could identify the opportunist in advance, but it is crucial that clearance procedures be able to identify and exclude professional criminals (and possibly novice criminals) from positions with access to nuclear material or sensitive portions of a facility.

Finally, it is possible that a professional criminal or criminals outside could mastermind a plot involving novice criminals or opportunists inside.

Even though any of the adversaries listed in the matrix may at some point engage in terrorist action and thereby become a terrorist, the *political terrorist* is understood to be a person who belongs to a group that wishes to bring about political change by violent and spectacular attacks on prominent targets and who habitually and by conviction goes the terrorist route.

We define the *antinuclear extremist* as a person willing to commit illegal acts in opposing nuclear programs either on ecological grounds, believing that nuclear

[1]Margaret Krahenbuhl, "Computer Crime as an Analog Threat to the Nuclear Industry: A Preliminary Assessment of the State of the Art," The Rand Corporation, unpublished paper, March 1978.

programs endanger the human habitat and may engender adverse genetic effects or health hazards, or on other ideological grounds, such as reasons of safety, opposition to nuclear weapons, or other political or economic concerns. Considering that the antinuclear adversary, particularly if motivated by ecological considerations, is likely to be concerned with human life, he or she is not likely to attempt the highest levels of destruction and disruption, but may still resort to such serious actions as stealing SNM in strategic guantities, or "seize-and-hold" operations.

Philosophical or religious extremists would include individuals or groups whose religious beliefs, code of conduct, ethics, or value systems might persuade or allow them to attempt acts of mass destruction through attacks on nuclear facilities or the use of nuclear material.

A *psychotic* is one whose view of reality is distorted by impaired personality function or brain function. Typically, the psychotic is unable to make clear distinctions between external reality and internal fantasies or delusions. The psychotic's destructive behavior is often the result of unfounded suspicions and fears combined with aggressive impulses unchecked by the reality assessment found in normal people.

In this report, we have distinguished between psychotics who are functional in society and those who are dysfunctional. The functional ones constitute the larger potential threat. Assassins, "mad" bombers, arsonists, and mass murderers are often "functioning" psychotics, capable of holding down jobs and interacting socially to some degree, although their contact with the outside world is usually very limited. Dysfunctional psychotics are readily identified as being mentally disturbed and incapable of planning any action requiring a long attention span or sequential steps. They are impulse-driven, and when responding to impulse are not capable of rational thinking.

Individuals acting for idiosyncratic reasons are persons who, while *not* psychotic, are driven by psychological needs to take independent actions peculiar to them (and often tied to certain talents) that are designed to serve egocentric motivations. These may take many forms, including exhibitionism (a desire for attention and publicity); megalomania (delusions of greatness, an obsession to do extravagant or grand things); and a simple desire to prove that certain actions can be accomplished. Everyone has idiosyncrasies, but these people act them out in ways that, although not *intended* to harm anyone, could cause a great deal of damage.

For purposes of this matrix, to reduce the overlapping of categories, we define *hostile employees* as nuclear industry employees (both permanent and temporary, plus ex-employees and consultants) who commit crimes because of specifically job-related grievances or labor-related conflict. It does not include employees who act out of economic, ideological, or psychotic motives. (Note that the more inclusive definition in Chap. 5 encompasses any employee adversary, regardless of motive.) Hostile employee actions could range from phoning in bomb hoaxes against facilities to violent action against property or personnel.

Mercenaries, foreign agents, and foreign commandos include individuals or groups knowingly and willingly in the service of a foreign government. "Mercenaries" may include professional criminals or terrorists recruited by and acting under the direct orders of a foreign power. "Foreign agents" would generally imply insiders acting covertly. (It is conceivable that a high-level official in the nuclear

industry might serve as an agent of a foreign power.) The term "foreign commandos" implies a paramilitary operation mounted by a foreign power but not necessarily using the nationals of that power. This is a postulated threat not dealt with in this report; however, actions by commandos have been addressed in terms of the resources and capabilities displayed in small-scale commando raids, as described in our earlier report.[2]

TYPES OF ACTIONS

Theft

(See the matrix for the definitions of three categories of theft.) Theft is viewed as a single action, although there could, of course, be a series of thefts. We distinguish theft from *diversion*, in that diversion is viewed as a crime that can be carried out only by insiders, or by outsiders with inside assistance. "Diversion" is also meant to imply an attempt to conceal the crime by altering the books or removing quantities small enough to be written off without arousing immediate suspicion. Diversion also implies an operation that continues for a period of time, as opposed to a single act, although this may not always be the case.

Sabotage

(See the matrix for the definitions of three levels of sabotage.)

Kidnapping or Violence Against Persons

Kidnapping or violence may be directed against officials or employees of the nuclear industry (or possibly members of their families) *because* of their positions in the nuclear industry. Criminals might use such life-threatening acts to coerce victims into cooperating with their crimes. Terrorists might do the same for intimidation, as in the Basque terrorist threat to assassinate the head of Iberduero, the Spanish electric utility, if nuclear plant development were not halted.

Misuse of Facility

Misuse represents any unauthorized use of a nuclear facility by those who, by virtue of their position, control operations in all or parts of the plant. Such misuse can occur for economic profit, or in the service of domestic or foreign groups. It could include any kind of unauthorized processing of nuclear material.

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[2]Peter deLeon, Brian Jenkins, Konrad Kellen, and Joseph Krofcheck, *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs*, The Rand Corporation, R-2225-SL, February 1978.

Standoff Attack

(See the matrix for the definitions of two levels of standoff attack.) A standoff attack implies that there is no subsequent assault.

Disclosure of Classified Information

People who have legal access to it may make unauthorized disclosure of classified or otherwise restricted information for purposes of financial gain, aid to adversaries, or influencing or inciting the public. The disclosure could be clandestine or public.

Faking of a Diversion

A person might fake a diversion for purposes of extortion, coercion, or disruption. That is, a person might attempt to create the appearance of a successful diversion or covert theft of nuclear material simply by manipulating records, altering the identity of containers, or moving the material to another location within the facility but never actually attempting to remove it from the facility. That alone would cause disruption. However, an adversary might then claim possession of the "missing" material or offer to provide information as to its whereabouts as part of an extortion scheme or to obtain compliance with certain demands. Such an action would almost of necessity require the participation of an insider.

MODES OF ACCESS

For all of the actions included in the matrix that involve penetration of a nuclear facility, adversaries might use any one of four basic modes of access:

1. By force: This would be an open assault.
2. By stealth: This would be an undetected entry.
3. By deceit: This would be access by adversaries posing as employees, inspectors, or some such legitimate personnel.
4. By being insiders already within the facility.

Also, any of the first three modes might involve assistance by insiders.

ACTIONS THAT HAVE OCCURRED

Events postulated in the matrix that have occurred either in the United States or abroad are indicated by solid bullets. Events that may have occurred—but where evidence is inconclusive—are indicated by hollow bullets. With regard to the possible actions of professional criminals, we know of no threats to destroy or disable nuclear facilities or disrupt nuclear programs, and no thefts of SNM. There is, however, at least one known theft of uranium ore by employees who, although perhaps not professional criminals strictly speaking, did have criminal records.

POSSIBLE NUCLEAR-RELATED CRIMES

Adversary	Possible Crimes Involving the Security of U.S. Nuclear Facilities or Programs			Crimes Not Involving the Security of U.S. Nuclear Facilities or Programs
	Destroy or Disable Nuclear Facilities	Acquire Nuclear Material or Information	Disrupt Nuclear Programs	
		Economic Motivation		
Professional criminals	Threaten or engage in sabotage in connection with extortion	• Theft (all categories) by stealth or force[a]	Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion	Nuclear threats in connection with extortion or coercion Sale or attempted sale of nuclear material
Occasional or novice criminals or opportunists	Threaten or engage in sabotage in connection with extortion	• Theft (all categories) not by force[a] Diversion Theft of information Misuse of facility	Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion Fake a diversion for the purpose of extortion Disclose classified information	• Nuclear threats in connection with extortion or coercion • Sale or attempted sale of nuclear material
		Ideological Motivation		
Political terrorists	High-level standoff attack • Sabotage (all levels)	Theft (all categories)	• Threaten or engage in kidnapping or violence against persons • Seize and hold a facility with (or without) hostages	Nuclear threats in connection with extortion or coercion Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device
Antinuclear extremists	Low-level standoff attack • Low-level sabotage High-level sabotage (?)	Theft (all categories) Theft or purchase of information	• Trespass • Incite to illegal actions Seize and hold a facility (with hostages (?)) Disclose classified information	Nuclear threats
Philosophical or religious extremists	High-level sabotage Sabotage with radioactive release	Theft of SNM or nuclear weapons	Incite to illegal actions Threaten or engage in kidnapping or violence against persons Disclose classified information	Nuclear threats in connection with extortion or coercion Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device
		Personal Motivation		
Psychotics	(No action can be eliminated from the range of psychotic behavior)			
Individuals acting [illegible]	• Low level standoff • Low level sabotage	Theft (all categories) not by force Diversion Theft or purchase of information	• Pranks, hoaxes, bomb threats Fake a diversion Disclose classified information	• Nuclear threats in connection with extortion or coercion Fabrication of nuclear device
[illegible]	Low level standoff • [illegible]	• Theft of non SNM or small quantities of SNM[b] Diversion [illegible] information	Incite to illegal actions [illegible] Seize and hold a facility (with hostages (?)) • Hoaxes Threaten or engage in violence against person Disclose classified information	• Nuclear threats in connection with extortion or coercion

In Service of Foreign Government				
Mercenaries, foreign agents, or foreign commandos	High-level standoff ○ High-level sabotage Sabotage with radioactive release	○ Theft (all categories) Diversion ● Theft or purchase of information ○ Misuse of facility	Engage in kidnapping or violence against persons ● Disclose classified information	Sale or attempted sale of nuclear material Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device

NOTE: ● = occurred
○ = may have occurred

[a]We know of no proven thefts of SNM. The ● refers only to known theft of non-SNM.

TYPES OF ADVERSARIES

Professional criminal: crime is main source of livelihood.

Occasional or novice criminal: may have criminal record but not a habitual offender.

Opportunist: takes advantage of opportunity for illegal gain; no prior criminal record.

Political terrorist: member of group aiming for political change through violent attacks.

Antinuclear extremist: commits illegal acts out of opposition to nuclear programs (for ecological, safety, political, or economic reasons).

Philosophical or religious extremist: beliefs would condone or encourage acts of mass destruction.

Psychotic: impaired personality or brain function; distorted view of reality.

Individual acting for idiosyncratic reasons: not psychotic, but driven to take illegal actions to satisfy egocentric motivations (e.g., exhibitionism, megalomania).

Hostile employee: nuclear industry employee motivated by specifically job-related grievances or labor-related conflict.

Mercenaries, foreign agents, and foreign commandos: knowingly and willingly serve foreign government. Mercenaries may include professional criminals or terrorists; "foreign agents" implies insiders acting covertly; "foreign commandos" implies paramilitary operation mounted by foreign power, not necessarily using nationals of that power.

TYPES OF ACTIONS

Theft (by stealth or force): matrix distinguishes three categories:

Theft of non-SNM: e.g., equipment, conventional explosives, unenriched uranium.

Theft of SNM: special nuclear material in quantity too small to fabricate nuclear weapon.

Theft of SNM in strategic quantities: e.g., a nuclear weapon, a nuclear weapon component, or enriched nuclear material sufficient to fabricate weapon.

Diversion: theft by insiders (or with insider assistance) designed to conceal loss by altering records.

Sabotage: matrix distinguishes three levels:

Low-level: vandalism or action intended to temporarily disrupt operations or disable facility.

High-level: destruction of a facility involving danger to human lives.

Sabotage with radioactive release: destruction of a facility intended to create radioactive release, endangering public safety.

Kidnapping or violence against persons: directed against nuclear industry officials or employees (or families) for coercion or intimidation.

Misuse of facility: unauthorized use of nuclear facility (e.g., to process stolen material).

Standoff attack: matrix distinguishes two levels:

Low-level: e.g., pistol or rifle fire directed against nuclear facilities or transport vehicles.

High-level: e.g., use of crew-served weapons (mortars or rocket-propelled grenade launchers), aerial bombing, or use of remotely piloted aircraft or vehicles carrying explosives.

Disclose classified information: unauthorized disclosure of classified information by those with legal access, for financial gain, to aid adversaries, or to influence or incite public.

Fake a diversion: create the appearance that nuclear material is missing by manipulating records, altering identity of containers, or concealing material within facility (for extortion, coercion, or disruption).

Similarly, occasional or novice criminals or opportunists have not, as far as we know, threatened destruction or disruption for purposes of extortion, but numerous minor incidents of theft at nuclear facilities have been reported. Some were clearly the work of insiders, such as the theft of fuel rods from a reactor in England in 1966 and the theft of uranium from a plant in India in 1974. Break-ins and thefts at nuclear facilities have also been reported. None entailed the use of firearms. None involved SNM. Although we know of no incidents involving the misuse of nuclear facilities, there was one reported case of a substantial bribe offered to a Texas firm to process uranium secretly. Also, an illicit offer to sell nuclear material was made to a U.S. firm in 1978. There have been several such cases. Finally, some of the nuclear threats appear to be the work of amateur extortionists.

Political terrorists have claimed credit for token bombings (categorized as low-level sabotage) at nuclear facilities in the United States and Europe. Breton and Basque separatists have claimed credit for more serious acts of sabotage in France and Spain. None involved the release of radioactive materials. There have been no reported attempts by terrorist groups to steal nuclear material or weapons; however, interviews with two former members of West Germany's terrorist groups suggest that such action has been at least contemplated. Terrorists in Spain have kidnapped officials of nuclear facilities for the purpose of interrogating them and taking their keys to place bombs in their offices. The same terrorist group has threatened prominent officials in the nuclear industry with assassination if the planned nuclear programs were pursued. Terrorists in West Germany have placed bombs at the homes of those charged with the security of nuclear facilities. Argentina provides the only incident in which a nuclear facility (at the time still under construction and unfueled) was briefly taken over by terrorists. There have been armed assaults on nuclear facilities in Spain, and armed terrorists recently broke into a nuclear facility in Italy.

Antinuclear extremists have claimed responsibility for bombings at nuclear facilities and other incidents of low-level sabotage in Switzerland, Sweden, France, and the United States. Some of the antinuclear demonstrations in Europe have been violent, with planned mass assaults by demonstrators. Demonstrators opposed to nuclear programs in the United States have not gone beyond trespassing. There are no known criminal actions against nuclear facilities by religious extremists.

Mentally disturbed persons are known to be responsible for at least one incident of arson in the United States (a fire at the Indian Point nuclear reactor in 1971), and the theft and deliberate dispersal of radioactive material in Austria in 1974. Several incidents of low-level and high-level sabotage in France are suspected to be the work of a psychotic. Many of the nuclear threats clearly appear to be the expression of mentally disturbed persons.

A number of incidents of shots inexplicably fired at nuclear facilities, and of low-level sabotage, can be attributed to idiosyncratic behavior. Individuals have penetrated protected nuclear facilities or carried out other pranks simply to show it could be done or to demonstrate that they could do it. Idiosyncratic behavior also explains a number of the bomb threats and nuclear hoaxes.

Although in most cases the perpetrators have never been identified, it is safe to say that hostile employees probably are culpable for some of the reported incidents of low-level sabotage, some of the thefts, and no doubt many of the bomb

threats at nuclear facilities. Hostile employees are suspected of scattering uranium dioxide pellets on the ground at Kerr-McGee adjacent to a building where the material was processed.

Many suspect that Israeli commandos were responsible for the destruction of the critical components of two reactors being built in France for delivery to Iraq. (A previously unheard-of antinuclear group claimed responsibility. French officials are themselves suspected by some of having engineered the sabotage in order to renege on their pledge to provide Iraq with the strategically important reactors.) If the allegation is correct, the incident would provide the single example of high-level sabotage by foreign commandos. The hijacking of a ship carrying 200 tons of nuclear ore in 1968 also has been credited to Israeli commandos. If this is true, it would provide an example of theft of non-SNM by foreign commandos. There have been several cases of individuals charged with stealing information for delivery to foreign powers. Finally, although the Nuclear Regulatory Commission found no conclusive evidence that a diversion of a significant amount of special nuclear material either did or did not take place at NUMEC, speculation persists that Israel, working through an agent or agents in the plant, did effect a diversion.

It is noteworthy how many of the actions postulated in the matrix have occurred (or have been revealed to have occurred) in the past ten years. If this report had been prepared a decade ago, only a few minor thefts would have been attributed to criminals, and a few incidents of low-level sabotage would have been credited to individuals acting for personal reasons, most likely hostile employees. The range of actions that might be carried out by ideologically motivated individuals or groups would still be entirely theoretical. There would have been no nuclear hoaxes, no reported thefts of nuclear material, no reports of possible diversions, no violence on behalf of antinuclear causes, and no examples of actions by ideologically motivated adversaries.

Chapter 11
CONCLUSIONS

This report has explored the motivations that might impel individuals or groups to undertake criminal actions against nuclear facilities or programs. The rationale for studying motivations is based on the premise that understanding *why* certain adversaries might want to attack nuclear targets may help us anticipate *what* they might attempt to do and *how*. Simply put, different motivations imply different preferred actions. We have made no judgments as yet about various adversaries' capabilities (e.g., personnel, training, equipment, dedication) to carry out their preferred actions. Once linked (in future research) to analyses of adversary capabilities, the information offered here on preferred actions may assist in delineating the types of potential threats that nuclear security systems must be prepared to defend against. Despite its inherently speculative qualities, this forward chain of reasoning—from motivations to possible actions—is essential in the nuclear domain because of our limited experience to date with actual nuclear crimes from which to infer future dangers.

Perhaps the overriding conclusion that emerges from this study is that nuclear defenders must anticipate a surprisingly wide range of threats from an equally wide array of potential adversaries who may be animated by ideological, economic, or personal motivations, or some combination of the three. The possible actions by these adversaries vary greatly in intensity from the adolescent prank to mass destruction.

Nuclear programs seem to have all of the adversaries faced by any large industry (e.g., disgruntled employees, environmentalists) as well as those faced by any industry that deals in a highly valuable commodity. Nuclear programs also attract some peculiar adversaries: opponents of nuclear energy and weapons development; political terrorists who view such programs as symbols of the political and economic system they wish to destroy; and emotionally unstable people obsessed by the almost mystical qualities of nuclear power.

The presumed range of potential dangers to nuclear programs is not entirely hypothetical. Although few nuclear crimes have occurred to date, those that have occurred in the United States and abroad provide examples of most of the categories of perpetrators, motives, and actions postulated in this report (see the matrix in Chap. 10).

We have not attempted in this phase of our research to assess the probability that any of the actions described in the matrix will occur, beyond the simple observation that there have already been many low-level actions—bomb threats against nuclear facilities, low-level sabotage, nuclear hoaxes—that appear to have satisfied the aims of their perpetrators and therefore are likely to occur again. At least, the burden of proof would be on the opposite assertion. There is little basis for extrapolating from them to higher-level incidents, however. The next phase of our research will match motivations with the resources and capabilities that different categories of adversaries are likely to possess. That will provide a possible basis for assessing the comparative likelihood of various actions by any given adversary.

If we arrange the nuclear actions described in the matrix on a continuum according to the seriousness of the threat they pose to public safety, at one end would be acts such as bomb threats, hoaxes, and token acts of violence, which may not be aimed at producing public casualties or violence, but which, if publicized, could cause disruption and alarm. At the other end would be such actions as high-level sabotage or the release of radioactive material, which could directly endanger the public. Only those adversaries driven by blind fanaticism or psychological abnormalities appear likely to attempt nuclear crimes aimed at producing widespread casualties.

In our previous report on the attributes of potential criminal adversaries of U.S. nuclear programs, we noted that "in the recent history of nuclear incidents, a faint escalatory trend may be discerned." This trend, in terms of both the number and the seriousness of incidents, appears to have continued since 1977, when the earlier report was completed. Part of this trend may be due simply to a more complete reporting of nuclear incidents, evidence that the security of nuclear facilities has become a subject of increasing public concern. Part of it is also due to recent revelations of incidents that occurred years ago. The 1970s also saw intensive investigations by federal law enforcement agencies of the circumstances surrounding nuclear material unaccounted for at NUMEC in the 1960s. The net effect of such belated revelations is to create the impression that malevolent activity is more common in the nuclear domain than was previously thought.

The perception of a trend has a basis in reality, however. Although we have not seen acts of sabotage deliberately aimed at causing radioactive release, a number of incidents have occurred since 1977 in which adversaries have demonstrated greater sophistication or greater willingness to cause casualties. To be sure, most of them have occurred outside of the United States. In 1978, for example, Basque terrorists in Spain detonated a large bomb at a nuclear facility under construction, killing four and wounding 14 persons. Another bomb at the same site in 1979 killed one worker. These were the first incidents of nuclear-related terrorist sabotage to have caused casualties. Also in 1979, unidentified saboteurs destroyed the critical components in two reactors built in France for sale to Iraq. The past year in Europe also saw the use of nuclear material in an attempted suicide.

We have not seen in the United States the separatist problems or the active terrorist groups to be found in Europe, nor have we seen the violent opposition to nuclear energy programs experienced in some European countries. We have seen an increasing number of nuclear hoaxes in the 1970s, most of them puerile threats, as well as several malevolent incidents, including the sabotage of nuclear fuel rods at a nuclear facility in Virginia and a bizarre plot to steal a nuclear submarine armed with nuclear weapons.

In sum, many possible criminal actions that had not yet occurred several years ago, or were not known to have occurred, have since occurred or been revealed. The spectrum of postulated nuclear actions, except for the higher-order threats, has become less and less hypothetical.

We normally think of seriousness in terms of the threat posed to public safety. We recognize, however, that owing to popular conceptions and misconceptions of

nuclear energy, an incident of relatively harmless actual consequence conceivably could produce large-scale effects. For example, a well-formulated hoax nuclear threat might conceivably cause spontaneous evacuation, panic, looting, and other disorders that would threaten public safety. (As technical information about nuclear subjects becomes increasingly available to the public, and if there is a greater incidence of nuclear material reported missing or unaccounted for, we might expect to see both a greater number of nuclear threats and threat messages that appear, at least on the surface, to be more credible.) This magnification of an incident or threat is possible because there is no accepted measure of the potential danger inherent in the event. Even the experts disagree on highly technical points. The fear invoked by the word "nuclear" in the minds of many people may provide a special attraction to certain categories of adversaries, and coping with this phenomenon legitimately falls within broader security concerns.

This report has examined three categories of potential adversaries: those who might be driven by ideological motives, economic motives, or personal motives. We have also considered the special problem of crimes by nuclear industry employees. The following paragraphs summarize our conclusions regarding each of these types of adversaries.

Political terrorists constitute one major category of ideologically motivated adversaries. From the standpoint of motivations and intentions, we foresee the possibility of two types of terrorist actions. First, and more likely, are actions intended to appeal to opponents of civilian or military nuclear programs, whom the terrorists may regard as a potential constituency. Such actions might include threats against or sabotage of civilian nuclear facilities under construction or in operation; threats or actions against executives or security officials at nuclear facilities, in the latter case particularly where there may have been violent confrontations between antinuclear demonstrators and police or security personnel; operations on behalf of persons jailed for antinuclear activities; and armed occupations, thefts, or other actions calculated to demonstrate the danger of nuclear programs or the inadequacy of security measures. Second, we are liable to see coercive actions in the nuclear domain intended to cause widespread alarm and increase the leverage of a terrorist group making demands on government. These actions might involve theft of a nuclear weapon or SNM for threatened use in an explosive or dispersal device, or the fabrication of a credible hoax threat.

As to the much-discussed possibility that terrorists might actually employ a nuclear capability to wreak massive destruction, there is a consensus among those who study terrorism that the apparent moral and political constraints that limit large-scale, indiscriminate acts of terrorism still apply. However, there is an accompanying consensus that the conventional terrorist tactics used thus far—bombings, assassinations, kidnappings, hijackings—may be losing their effectiveness. The coercion achieved through such tactics has been declining since the mid-1970s as governments have become more resistant to meeting the demands of terrorists. The publicity value of these actions has also declined through their having become commonplace in the last decade. Like the losing side in a war, terrorists might feel an irresistible urge to escalate all the way up to the "nuclear option." The brutalizing effect of their own continued violence, the losses they have suffered, their perception that the police and military apparatus of the state have been unleashed against them, or possible growing cynicism regarding "the people"

on whose behalf they claim to fight, could erode the constraints against larger-scale violence, perhaps even allowing nuclear action to be seriously contemplated. However, such action would represent a quantum leap in the application of violence even by those we call terrorists.

Such a development would be more likely among the most fanatical and violent terrorist groups (e.g., the Japanese Red Army), those with more millenial aims as opposed to a concrete political program. To date, domestic terrorist groups that have operated in the United States in recent years have not exhibited the millenialist tendencies that would suggest a willingness to consider an act of nuclear destruction as a serious option. However, we cannot exclude the possibility that some terrorist group active in another part of the world might attempt such an action in the United States, to extract foreign policy concessions or to punish the United States for past actions, or attempt to steal nuclear material from a U.S. facility to be used in a nuclear scheme in another country.

Antinuclear extremists represent a second ideological source of potential adversaries. Under some circumstances, such persons might be prompted to commit crimes against nuclear programs. One type of action might attempt to interfere with facility operations directly, as through bombings, arson, other forms of sabotage, or violent attack. Damage to the nuclear plant—and presumably the cessation of alleged dangers to health, safety, and the environment—would be the primary intended goal, with negative publicity for nuclear programs a desired secondary goal.

An alternative type of action might be an attempt to demonstrate the alleged vulnerability of the nuclear industry's security and safeguards systems. For example, antinuclear extremists might try to steal a nuclear weapon, divert nuclear material from a reactor facility, hijack a shipment of nuclear material, improvise a nuclear device, or penetrate and take over a reactor control room solely to demonstrate that such things could be done by more malevolent adversaries. An incident might be designed both for propaganda value—using media coverage to win converts to the antinuclear position—and to attempt to force the government or industry to upgrade security measures or halt nuclear activities.

In either type of action, we would expect most antinuclear extremists to attempt to avoid human casualties.

Despite the nonviolent history of antinuclear demonstrations in the United States, the possibility remains that radical groups or unstable people might join future demonstrations and attempt to foment violence. It is also conceivable that a terrorist group (repeating a tactic already employed elsewhere in the world) would try to incite a massive violent confrontation with police and security guards during a demonstration, in order to penetrate and sabotage the facility during the ensuing chaos.

A secondary effect of a violent demonstration, perhaps more significant than the chances of immediate damage to a facility, is that confrontation with police, injuries, and arrests could have a radicalizing influence on some demonstrators or their sympathizers, making them more likely to engage in future criminal actions.

The antinuclear movement is still so new that it is difficult to predict its future course, but the movement appears to be expanding, to judge from the growing numbers of demonstrators attending protest rallies and the proliferation of local groups opposing specific facilities.

Continued escalation in the public controversy surrounding nuclear energy—as a result of mostly negative news coverage, fictional treatments of nuclear-related issues, and such incidents as the accident at Three Mile Island—may intensify the zeal of some antinuclear activists to the point that they would be willing to commit criminal antinuclear acts, especially if they perceived legal means of fighting nuclear development as failing.

Finally, widespread confusion and ignorance among the populace on the subjects of the utility of nuclear power installations and of their weaknesses, both real and imagined, must be regarded as an additional vulnerability of nuclear facilities. More than a few people, bewildered by the complexities of nuclear physics and technology—or, worse yet, by experts' diametrically conflicting views—may despair of being able to reach rational conclusions regarding nuclear issues and decide to cut the Gordian knot by favoring radical and aggressive negative action. They may be all the more inclined to do so if their fears are stimulated by further, equally hard-to-understand events such as the Three Mile Island accident.[1]

With regard to economically motivated crimes, nuclear theft appears to hold some potential attractions for professional criminals: the possibility of a very large monetary payoff (through sale, ransom back to the owners, or extortion); the psychological allure of excitement and challenge and the underworld reputation to be gained from such a grandiose Big Score; the possibility of securing immunity from prosecution during negotiations with the government; and the opportunity to wield power, at least temporarily, over society and government authorities.

However, strong countervailing deterrents to nuclear crime would also seem to be at work. Most criminals are not likely to have ways of contacting potential buyers for stolen nuclear commodities. They may have a healthy fear of exposure to radiation. They might not be able to count on protection from the criminal underworld. And the prospect of a massive government manhunt together with the virtual certainty of severe punishment if caught, adds to the many risks of what were uncharted criminal waters to begin with. In spite of it all, however, we cannot rule out the possibility that some few criminal minds would deem the payoff worth the risks. Experts agree that organized crime at least has sufficient resources to attempt nuclear theft. Whether they are likely to enter the nuclear domain remains a matter of speculation and debate.

To date, there is no evidence of a black market in nuclear material. It seems likely, therefore, that criminals would attempt to steal nuclear material only if commissioned by a buyer in advance (for example, the agent of a foreign government) or with the intent of ransoming the material back to its original owner.

New circumstances could change that picture, of course. The spread of nuclear energy programs, increased worldwide traffic in fissionable materials, and proliferation of nuclear weapons could widen the market for stolen nuclear material and cause professional criminals to reconsider their reluctance to deal in it. (The ex-

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[1]*Science* magazine takes its own ranks to task in this connection: "... the scientific community and the engineering professions have failed to help the other 98 percent of the population who are nonspecialists to grasp the technical foundations of modern life and associated threats to survival...." (Edward Wenk, Jr., *Science*, November 16, 1979.) It might be argued, however, that even if the scientific community had not been remiss in doing its best, its best might not have sufficed. It may simply be impossible to educate the public adequately, at the present time, with regard to the many aspects of nuclear power.

panding market for narcotics in recent years, for example, has further spurred an already flourishing drug trade.) If a few daring criminals were willing to pioneer in nuclear crime—and if they were "successful"—this could lead to further nuclear crimes. As in the case of airline hijackings a few years ago, new crimes tend to beget imitators. This would be particularly true if it became easier for criminals to find fences or other conduits for stolen material.

Psychotic people are another source of threat to nuclear programs. Virtually no type of action can be eliminated from the potential repertoire of acts considered by the functioning psychotic, that is, one who despite severe psychological disturbance is nonetheless capable of getting along in society and may be capable of planning a complex series of actions. Moreover, if operating within a delusional system, the psychotic adversary may feel completely justified in his actions (e.g., if celestial voices order him to carry them out). To the rational observer, the psychotic's actions or attempted actions are likely to appear bizarre.

Employees represent a special potential threat to nuclear programs because of their physical access to nuclear facilities and their special information and knowledge, which could enable them to exploit vulnerabilities in the system. Employees might be prompted to undertake hostile actions out of personal job frustrations; ideological disillusionment; economic self-interest; labor-related strife; a psychotic episode; or a variety of idiosyncratic reasons. Moreover, there is the danger of coercion of a loyal employee by outsiders, through threats of physical harm or blackmail, to cooperate in criminal acts against a nuclear facility. Depending on their motivation, employee crimes could range all the way from hoax bomb threats to theft of SNM to sabotage.

The more effective the security systems of nuclear facilities are rendered against outside penetration, the greater would be the need of outside adversaries to recruit insiders to cooperate in their criminal schemes. Thus, the insider issue would assume increasing importance for security considerations, and also for future research and analysis.

Professional criminals are unlikely to secure the more sensitive jobs in nuclear facilities, because most of them have criminal records that would be picked up during routine background investigations of applicants for such positions. The criminal with no record conceivably could slip through. And the amateur criminal or opportunist—the employee who will seize the chance to cash in on a fortuitous opportunity—probably cannot be identified in advance.

The multiplicity of possible crimes against nuclear programs presents a special challenge to those charged with defending against such actions. The wide range of threats calls for a wide-ranging defensive strategy. Protecting the perimeters of nuclear facilities against armed penetration from outside is obviously necessary but is far from sufficient. For example, defenders must also worry about hostile actions by insiders, and the possibility that seemingly stable employees will suffer psychotic breaks triggered by job-related pressures or other forces in their personal lives. Even the most sophisticated program of advance psychological screening of personnel is no guarantee against destructive acts by employees.

It is not our purpose here to make specific recommendations about security measures. The function of this report has been to identify the need for a comprehensive and coordinated defensive strategy, given the extensive motivational base for nuclear crime that we have described. The components of such a strategy would

include mechanisms and procedures designed to (1) provide physical and psychological deterrents to nuclear-related crimes; (2) defeat at the outset any nuclear-related crime that is attempted; (3) respond effectively in the event of a nuclear-related incident that is not successfully defeated in its opening stages. Such a response would necessarily require coordination of numerous governmental entities (e.g., local law enforcement, state and federal officials, military personnel) and effective handling of such complex issues as news media coverage and possible civilian evacuation.

For nuclear security officials to conceive of a defensive strategy in such far-reaching terms is an ambitious charge. However, the unique qualities of the domain of nuclear crime would appear to demand more than a "castles and moats" approach to the security of nuclear programs.

POSSIBLE NUCLEAR-RELATED CRIMES

Adversary	Possible Crimes Involving the Security of U.S. Nuclear Facilities or Programs: Destroy or Disable Nuclear Facilities	Acquire Nuclear Material or Information	Disrupt Nuclear Programs	Crimes Not Involving the Security of U.S. Nuclear Facilities or Programs
		Economic Motivation		
Professional criminals	Threaten or engage in sabotage in connection with extortion	• Theft (all categories) by stealth or force[a]	Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion	Nuclear threats in connection with extortion or coercion Sale or attempted sale of nuclear material
Occasional or novice criminals or opportunists	Threaten or engage in sabotage in connection with extortion	• Theft (all categories) not by force[a] Diversion Theft of information Misuse of facility	Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion Fake a diversion for the purpose of extortion Disclose classified information	• Nuclear threats in connection with extortion or coercion • Sale or attempted sale of nuclear material
		Ideological Motivation		
Political terrorists	High-level standoff attack • Sabotage (all levels)	Theft (all categories)	• Threaten or engage in kidnapping or violence against persons • Seize and hold a facility with (or without) hostages	Nuclear threats in connection with extortion or coercion Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device
Antinuclear extremists	Low-level standoff attack • Low-level sabotage High-level sabotage (?)	Theft (all categories) Theft or purchase of information	• Trespass • Incite to illegal actions Seize and hold a facility (with hostages (?)) Disclose classified information	Nuclear threats
Philosophical or religious extremists	High-level sabotage Sabotage with radioactive release	Theft of SNM or nuclear weapons	Incite to illegal actions Threaten or engage in kidnapping or violence against persons Disclose classified information	Nuclear threats in connection with extortion or coercion Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device
		Personal Motivation		
Psychotics	(No action can be eliminated from the range of psychotic behavior)			
Individuals acting for idiosyncratic reasons	• Low-level standoff • Low-level sabotage	Theft (all categories) not by force Diversion Theft or purchase of information	• Pranks, hoaxes, bomb threats Fake a diversion Disclose classified information	• Nuclear threats in connection with extortion or coercion Fabrication of nuclear device
Hostile employees	Low-level standoff • Low-level sabotage High-level sabotage (?)	• Theft of non-SNM or small quantities of SNM[a] Diversion Theft of information	Incite to illegal actions Trespass Seize and hold a facility (with hostages (?)) • Hoaxes Threaten or engage in violence against persons Disclose classified information	• Nuclear threats in connection with extortion or coercion
		In Service of Foreign Government		
Mercenaries, foreign agents, or foreign commandos	High-level standoff ○ High-level sabotage Sabotage with radioactive release	○ Theft (all categories) Diversion • Theft or purchase of information ○ Misuse of facility	Engage in kidnapping or violence against persons • Disclose classified information	Sale or attempted sale of nuclear material Detonation of nuclear device or dispersal of nuclear material Fabrication of nuclear device

NOTE: • = occurred
○ = may have occurred

[a]We know of no proven thefts of SNM. The • refers only to known theft of non-SNM.

TYPES OF ADVERSARIES

Professional criminal: crime is main source of livelihood.

Occasional or novice criminal: may have criminal record but not a habitual offender.

Opportunist: takes advantage of opportunity for illegal gain; no prior criminal record.

Political terrorist: member of group aiming for political change through violent attacks.

Antinuclear extremist: commits illegal acts out of opposition to nuclear programs (for ecological, safety, political, or economic reasons).

Philosophical or religious extremist: beliefs would condone or encourage acts of mass destruction.

Psychotic: impaired personality or brain function; distorted view of reality.

Individual acting for idiosyncratic reasons: not psychotic, but driven to take illegal actions to satisfy egocentric motivations (e.g., exhibitionism, megalomania).

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Diversion: theft by insiders (or with insider assistance) designed to conceal loss by altering records.

Sabotage: matrix distinguishes three levels:
- Low-level: vandalism or action intended to temporarily disrupt operations or disable facility.
- High-level: destruction of a facility involving danger to human lives.
- Sabotage with radioactive release: destruction of a facility intended to create radioactive release, endangering public safety.

Kidnapping or violence against persons: directed against nuclear industry officials or employees (or families) for coercion or intimidation.

Misuse of facility: unauthorized use of nuclear facility (e.g., to process stolen material).

Standoff attack: matrix distinguishes two levels:
- Low-level: e.g., pistol or rifle fire directed against nuclear facilities or transport vehicles.
- High-level: e.g., use of crew-served weapons (mortars or rocket-propelled grenade launchers), aerial bombing, or use of remotely piloted aircraft or vehicles carrying explosives.

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Fake a diversion: create the appearance that nuclear material is missing by manipulating records, altering identity of containers, or concealing material within facility (for extortion, coercion, or disruption).